UNIVERSITY OF TAMPERE
School of Management

Innovation Platforms Integrating Global Human Capital into Knowledge Economy

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ABSTRACT

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This study contributes to the policy discussion on regional development and internationalization by discussing how innovation platforms may integrate human capital into innovation activities. Policy relevance is related to the globalization of innovation practices and how local and global are linked together. The focus is on practices that support the emergence of innovation communities and innovation platforms. This is discussed by concentrating on the integration of global human capital into Finnish innovation activities and how a global MNC may link to local resources. I use knowledge economy as a theory and innovation communities and innovation platforms as key concepts.

According to a literature review concerning globalization of innovation communities (Web of Science), interest towards the study field has grown within the 20th century and especially during the last few years. Innovation community is a promising but still a vague concept that needs to be developed. Here the definition was based on empirical work. The empirical part of the study consists of three different data sets: (1) screening innovation communities (Finland), (2) survey conducted in Demola (Finland) and (3) fieldwork in Microsoft Innovation Centers (Brazil). Different research methods have been applied to the data.

Based on a small screening innovation communities attribute to the combination and creation of knowledge and thus to the integration of global human capital. Most successfully people are integrated to innovation activities in innovation platforms that are more policy-tools supporting the emergence of innovation communities than purely innovation communities. The case study of Demola showed that Demola integrates foreign-born students to innovation processes at least as efficiently as Finnish students and that Demola works as a tool to build global innovation communities. Fieldwork in Brazil suggests that global MNCs may tap into local innovation systems efficiently. To do so they have to be designed to match with the local ecosystem. The main difference between Microsoft Innovation Centers and Demola is that Microsoft Innovation Centers are global and trying to tap into the local ecosystems whereas Demola works from the local level and establishes global connections by linking foreign-born people into innovation processes: Microsoft Innovation Centers try to harness local knowledge to benefit global means and Demola tries to utilize global knowledge to benefit the local economy. Studying them shows that locality is important in both cases and establishing connections (either local or global in nature) requires meeting up with the expectations of people involved in the activities.

In sum innovation platforms bring together a global composition of talent and link this global human capital to the local economy. It seems that innovation platforms do not only participate to the formation of global innovation communities but they are the generators of such global compositions and may be seen as factories of global human capital. Further research about the formation of global human capital and structure of innovation platforms is still required.

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Tutkimus kiinnittyy aluepoliittiseen keskusteluun kansainvälistymisestä keskittymällä siihen, miten innovaatioalustat voivat integroida inhimillistä pääomaa innovaatiotoimintoihin. Aluepoliittinen merkitys liittyy globalisaatioon ja innovaatiotoimintoihin sekä siihen, miten paikallinen ja globaali voidaan liittää yhteen. Tutkielman kiinnekohta on toiminnoissa, jotka tukevat innovaatioyhteisöjen ja –alustojen syntymistä. Tätä käsitellään keskittymällä globaalin inhimillisen pääoman kiinnittämisellä innovaatiotoimintaan Suomessa sekä sillä, miten globaali monikansallinen yritys voi kiinnittyä paikallisiin resusseihin. Tutkielmassa käytän tietotaloutta teoriana sekä innovaatioyhteisöä ja innovaatioalustaa avainkäsitteinä.

Kirjallisuuskatsauksen (Web of Science) mukaan kiinnostus innovaatioyhteisöjen kansainvälistämiseen on kasvanut vuosituhannen kuluessa, etenkin viime vuosina. Innovaatioyhteisö on lupaava, mutta edelleen epäselvä käsite ja termin selventämiselle on tarvetta. Tässä tutkielmassa määrittely perustuu empiirisiin lähteisiin. Tutkielman empiirinen osuus koostuu kolmesta eri aineistosta: (1) innovaatioyhteisöjen seulonta (Suomi), (2) Demolassa toteutettu lomaketutkimus (Suomi) ja (3) kenttätyö Microsoftin innovaatiokeskuksissa (Brasilia). Aineistoihin on sovellettu eri metodologioita.

Seulonnan perusteela voidaan sanoa, että innovaatioyhteisöt osallistuvat tiedon yhdistämiseen ja luomiseen ja täten inhimillisen pääoman integroimiseen. Parhaiten tässä onnistuvat innovaatioalustat, jotka ovat enemmän poliittisia menetelmätyökaluja tukemassa innovaatioyhteisöjen muodostumista kuin suoranaisesti innovaatioyhteisöjä. Demola aineiston perusteella voidaan sanoa, että Demola integroi ulkomaalaisia opiskelijoita innovaatioprosesseihin vähintään yhtä hyvin kuin suomalaisia opiskelijota. Demola toimii myös kansainvälisten innovaatioyhteisöjen rakentajana. Kenttätyö Brasiliassa osoittaa, että globaalit monikansalliset yritykset voivat kiinnittyä paikalliseen innovaatiympäristöön tehokkaasti kun ne on suunniteltu vastaamaan paikallisympäristön tarpeisiin. Suurin ero Microsoftin innovaatiokeskusten ja Demolan välillä on siinä, että innovaatiokeskukset ovat globaaleja ja ne yrittävät kiinnittyä paikallistalouteen, kun Demola puolestaan toimii paikallistasolta ja pyrkii rakentamaan globaaleja yhteyksiä. Microsoftin innovaatiokeskukset valjastavat pakallisosaamista globaalitalouden tarpeisiin ja Demola pyrkii soveltamaan globaalia osaamista edistämään paikallistaloutta. Nämä kaksi tapaustutkimusta osoittavat, että paikallisuus on tärkeä piirre molemmissa tapauksissa ja että paikallistalouden toimijoiden odotukset on otettava huomioon yhteyksiä muodostettaessa.

Innovaatioalustat muodostavat globaalin asetelman inhimillisestä pääomasta kytkien tämän pääoman paikallistalouteen. Vaikuttaa, että innovaatioalustat eivät vain osallistu innovaatioyhteisöjen muodostamiseen vaan ne myös generoivat globaalia inhimillistä pääomaa. Täten ne ovat globaalin inhimillisen pääoman tuottajia. Lisätutkimusta globaalin ihmisillisen pääoman muodostamisesta ja innovaatioalustojen rakenteesta tarvitaan edelleen.

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1 INTRODUCTION

Key factors in creating national and regional economic growth are somehow related to innovation activities and to the environment of the nation or the region. From economic point of view knowledge, innovation and learning have become the central factors in driving change (Romer 1993). Recent studies show that cultural diversity and differences in knowledge and capabilities of workers from diverse cultural backgrounds may enhance innovation and economic growth in the means of different views, which can help in forming new ideas and operational models (Niebuhr 2010).

Humans are now more mobile than ever before, which means that information and knowledge alongside with opinions and habits that are linked to personal attributes are continuously circulating both in organizational and in geographical terms (Karppi 2012). Therefore also the operational environment of urban development activities is changing from national to global and learning in development networks is becoming increasingly important and even essential for metropolitan economies. The new operational environment consists mainly of two factors; global competition is increasing and it has been mainly innovations that create economic growth. Hence urban regions need to develop in a more modified way in order to create new kind of competitive edge. (Kostiainen 2002.)

Over the last decades there has been a rapid internationalization of higher education, when countries have simultaneously started to promote immigration of the highly-skilled into to their economies (Suter & Jandl 2008). This had lead to the competition on talent becoming global. Hence this study concentrates on the role of innovation platforms integrating[1] global talent into innovation activities in order to enhance regional knowledge-based development. This study increases understanding on how innovation platforms may attribute to the formation of global innovation communities and linking global human capital into knowledge-based economic development. The role of innovation platforms in regional development linking local and global innovation activities by fostering the emergence of innovation communities is a rather new phenomenon and therefore further research is required.

Framework of this study is in knowledge-based economy and its implications that diversification of knowledge base creates regional economic benefits, and that global human capital increases

[1] Integration means the processes in which people relatively new to a country become part of the society. Integration

innovation and may thus enhance economic growth. Analyses upon the diversity of knowledge bases and the importance of highly-skilled personnel show that foreign talent may be important to a country´s economic development. With the framework I create understanding of global knowledge-based economic development and the role of innovation platforms in the regional development processes.

Knowledge-based economy as a theory has been used by many nations to improve national competitiveness. Innovation and the creation of new knowledge are the key features in creating national competitive edge (Chen 2008) and therefore it is important to understand how innovations occur. Innovations generally appear when different knowledge bases and expertise are combined and research also shows that diversity of opinion increases knowledge (Nahapiet & Ghoshal 1998). Smith (2001) sees that innovations are generated through the activities of skilled personnel. Also Fujita and Weber (2004) argue that cultural diversity of the labor force might be of a special importance for R&D activity since the generation of new products and ideas heavily relies on individual talents and skills from diverse educational and cultural environments. This is explaining why competition on talent has become global within the recent years.

Human capital is seen as the key factor to enhance economic growth (OECD 1998). Human capital is essential for development because education and training contribute to the generation and adaptation of new technologies and because education has clear impacts on productivity (Alburquerque, Rodrígues, Román & Ruiz 2002, 101). Whereas *human capital* can be understood as the knowledge and skills of an individual, *social capital* refers to the aspects of social life (e.g. networks and relationships) that enable people to interact and work together. Regional development is linked to the increase of social capital (ibid. 2002) for social capital increases the efficiency of action and diminishes the level of opportunism. Social capital may also enhance the achievement of some objectives that might be impossible to reach without the social dimension or only with an extra cost. (Nahapiet & Ghoshal 1998, 244–246.) Social contacts require interaction that is best provided by various communities. Communities create and support identities of people participating in them and they may be seen bringing together a number of individuals who within the community build a unified identity (Quinn 2010). Innovation communities may be used to build global pipelines and also link foreign-born people into country´s regional innovation activities. Thus innovation communities seem to have an important role in increasing social and human capital.

The focus of this study is in practices that support the emergence of innovation communities and innovation platforms. This is discussed by concentrating on the integration of global human capital into a nation´s innovation activities and how global MNCs (multi-national corporations) may tap into local resources. Therefore I use knowledge economy as a theory and innovation community and innovation platforms as key concepts. The research consists of a literature review of global innovation communities and three different data sets in the empirical part: screening innovation communities in Finland, and case studies of a local developer in Finland (Demola) and a global MNC linking into local economy in Brazil (Microsoft Innovation Centers). The focus in the research is on how local and global may be linked together.

Demola is a Finnish innovation and development platform of which participants 30 to 40 percent are foreign-born students. Therefore Demola is a significant player in the regional level involving foreign-born students into innovation activities. Demola data consists of a survey that enabled to study how students integrate to innovation activities through the platform and whether there are differences between the international and native members of the student team in linking into the community and its incentives. It was also acknowledged that the student groups may have different ties to more permanent institutional structures in the area and thus the study also reached to explore whether these ties affect on level of integration in the different student groups.

After understanding the local operations Demola provides to strengthen the economy in Tampere region it became interesting to study innovation practices in leading global MNCs. I conducted eleven interviews in three Microsoft Innovation Centers in Brazil to learn how global is connected to the local level and how a big global company such as Microsoft taps into local knowledge economy. The case study increases understanding on how local knowledge may be utilized to benefit a global MNC. Whereas the Demola case concerns on how global knowledge may be used to benefit regional economy, the fieldwork carried out in Brazil suggests how innovation platforms may utilize local human capital to benefit the global players in economy.

Microsoft Innovation Centers in Brazil made an interesting point of reference because the market structure in Brazil differs a great deal from Finland. Brazil has huge national market that does not require internationalization like in Finland. The Finnish market is far from self-sufficient and therefore Finland is dependable on global connections. This makes the study relevant especially to Finland and to the Finnish policy-making.

1.1 Research Objectives and Questions

The crucial point of view builds on an idea that globalization and innovation are the engines of change and that mobile humans are the implementers of change in local economies. Thus the importance to understand the formation of global human capital becomes evident. Therefore this study will explore innovation platforms in regional development and internationalization in the context of global knowledge-based economy. The study focuses on innovation platforms as policy-tools and how they may link global human capital into regional knowledge-based economic development. As students are becoming more important part of innovation activities, it is important to focus on how students are linked into global innovation activities more firmly.

Thus the studied phenomenon is the role of global human capital in regional development. This is related to the locality of global knowledge economy. Globalization has enabled easier diversification of knowledge bases due to increased human mobility. Research has implied that differences in knowledge base and cultural backgrounds of people may create economic benefits for a region. Therefore it should be studied how global and local may be connected. I use case studies to explore the phenomenon. The study focuses on two different innovation platforms:

(1) Demola (Finland) enhances understanding on how foreign-born students (i.e. global human capital) is integrated to regional economy.

(2) Microsoft Innovation Centers (Brazil) helps to create understanding of how a MNC is connecting global and local. They integrate local students (i.e. local human capital) to global economy.

Difference between Demola and Microsoft is that Demola is local-born and trying to make use of the global knowledge to benefit the local market, and Microsoft is global and trying to tap into the local ecosystem. The following research questions are addressed:

- *How students are strived to be more firmly attached into global innovation activities?*
    - *How local innovation platforms help students in this (Demola)?*
    - *Are there differences between foreign-born and native students?*
    - *Does deep embeddedness in local academic institution support integration?*
- *What kind of (if any) attributes innovation platforms have to support the formation of global innovation communities?*
    - *What are the practices in leading global MNCs (such as Microsoft)?*

Each part of the study will discuss more questions, which have been set in line with the objectives of the study. In the last part these will be combined and concerned as one.

1.2 Relevance of the Study

This study contributes to the policy discussion on regional development and internationalization by discussing how local innovation platforms may integrate regional innovation activities to global economy. Policy relevance is related to the globalization of innovation practices, and therefore it is important to create practices that support the emergence of innovation platforms and integration of global human capital into innovation activities. It has been acknowledged that diversification of knowledge base may create economic benefits. Human mobility has increased and global talent has become important for countries to create competitive edge. Hereby a nation´s ability to lure global human capital has become an important skill and precondition to gain access to the global market of talent. Therefore in this operational environment countries need to develop their national and regional policy-making and build more global and diverse pipelines. The importance of understanding the reasons and possibilities of connecting global human capital more firmly to a country´s innovation system increases especially among (1) firms, (2) relevant policy-makers and (3) innovation platforms themselves.

Students have been recognized as an important source of talent as studies imply that young people are more likely to move between countries than older professionals. On a global perspective an increased number of students have started to pursue education outside their own country (CIMO 2013). With this development the role of universities has changed and they focus more on attracting international students.

As the number of international students is increasing it is important to understand how local innovation platforms may tap them into regional innovation activities (chapter 6). Also further comprehension of how local and global may be connected is important in this scenario (chapter 7). The latter refers to a case study of Microsoft Innovation Centers that considers the role of a global MNC in connecting students to global knowledge economy. Discussing Microsoft Innovation Centers in Brazil creates understanding on the importance of locality and expands comprehension of innovation platforms.

Case study of Demola increases understanding of integrating global human capital to regional innovation activities by comparing international and native students´ learning and integration processes. International students are entering Finnish universities as degree students or exchange students. These groups have different kinds of relationships to the local universities that may also influence how the students link to the local innovation ecosystem. Consequently the role of universities as supportive formal structures becomes interesting to study. As innovation platforms usually tap students in selective processes, the local universities may play a more permanent part in linking them to the local economy. Thus creating understanding on how both local innovation platforms and more permanent formal structures may contribute to the integration of international students is important when considering ways to strengthen a region.

This is relevant also for Finland because Finland has been a country with a low share of global talent. Finnish economy opened with the IT-explosion in the 1990s and it was only then, when the country became a part of globalization and was able to make use of the global economy. Globalization led to increasing immigration flows and new technology made knowledge the key factor in creating economic success all over the world. Students became the target of to promote knowledge economy also in Finland.

However, still in the beginning of the millennium the internationalization of higher education in Finland was at the lowest level in Europe (Raunio & Forsander 2009). Explaining factors may be found in that the Finnish culture may be characterized rather exclusive than inclusive and the national economy has been strongly built on endemic structures. Also the geographical location and difficult language may have been obstacles for internationalization.

Now the number of international students in Finnish universities is increasing and it has more than doubled from 2003 to 19 135 students in 2012. This is a result of a systematic work executed to promote the recruiting process. Finnish universities have been encouraged to recruit international degree students and the number of studies completed and degrees earned by

international students is among the criteria for public funding. This has led the universities to develop more graduate programs for the international students. (CIMO 2013.) Hence the role of universities has changed also in Finland and they focus more on attracting international students. As a result there are over 300 English programs offered in Finnish universities and Finland is actually one of the leading countries in offering English education in Europe (CIMO 2013).

Even though the number of international students in Finnish universities is increasing Finland should still find new ways to link foreign highly-skilled people into its knowledge economy. Finland should build more global innovation policies and therefore it is important to create understanding of the structures of innovation communities and innovation platforms, their operations and innovation processes in order to strengthen them. This study offers a perspective to innovation platforms, which in the Finnish economy is an emerging recourse. This study seeks to contribute both to the policy and academic discussion.

2 RESEARCH METHODS AND DATA

This study uses data from different sources to which it applies different research methods. As there are multiple sources of data and methods used in this study it is important to view them individually. However, first there are a few things that are important to mention. It is important to note that the study goes on in a chronological order in which the research proceeded. The research began from my personal interest over the theme and studying different sources of data increased my knowledge of the phenomenon, and thus led me to study other sources. After every part of the study I returned to the object of study and research questions, which were always specified. After describing the theory I move on to different sources of data. The different sources of data are a literature study, screening and two cases. Even though the sources of data are separate from each other they all work in favor of the studied phenomenon and research questions. Next I describe the research strategy and then move on to the framework and then to the literature study, screening and cases by outlining different sources of data and methods applied to cover them.

2.1 Research Strategy

The main research strategy of this study is *case study research.* Laine, Bamberg and Jokinen (2007) describe case study as a research strategy that makes use of only one or few objects of study or phenomena. However, it may use different sources of data and methods. It is significant to note that all empirical studies concern cases. Nevertheless case study as a strategy understands *case* differently than for example quantitative researches. In case studies *cases* focus on a specific phenomenon of which they aim to create understanding of. As case studies focus on phenomena and social processes the strategy is suitable to answer to questions such as *how* and *why.* The aim of case studies is to increase understanding of the case and circumstances. The case´s general meaning may increase by that the case may question the theory, complete it or create new. The force leading a case study is usually that the case is somehow important but the reasons for it are usually deduced only as the case study goes on. (Laine, Bamberg & Jokinen 2007.) This applies to this study as well.

It is important to tell the difference between the *case* and the *object of study.* The latter refers to the phenomenon that the case study is illustrating. The sources for observation may be different social units, organizations, partnerships et cetera. Depending on the nature of the *case* they may be interpreted as communities, projects, relations between local and global or policy-processes. Recognizing the theme of the research helps in connecting the case into previous academic discussions. There are usually two different possibilities to start a case study. (1) The researcher may begin from an interesting case and relate suitable concepts to it and thus determine what the object of study is. (2) On the other hand it is possible that the objective of study is already determined and hereby the researcher needs to find an interesting case to suite the concepts and further develop them. In practice case study is usually something between these two: the case affects the concept selection and the concepts affect the case. (Laine, Bamberg & Jokinen 2007.) This study also sets in the between the two extremes.

Case studies may combine both qualitative and quantitative sources of data. The precondition for a case is that the object of study is only one (or a few) case(s) whereas in quantitative research the number of research units is significant. (Laine, Bamberg & Jokinen 2007.) The relation between the case study and the empirical context has not been outlined beforehand. Defining it is part of the research process. (Eräsaari 2007.) Because of the relation between the case and its context, it is not obvious how the research question is formulated in a case study (Häikiö & Niemenmaa 2007). Furthermore, a case study is not a representative sample of the population, as a quantitative research may be: an average case does not exist (Laine, Bamberg & Jokinen 2007).

As in case studies the research usually sets of from a phenomenon that interests the researcher, the researcher often has prior knowledge about the studied phenomenon, too. The preliminary research problem is based on this. To solve the problem, specifying research questions are developed. These questions lead the researcher to different sources of empirical data. The researcher has to determine how the different sources of data assist in formulating the answer to the research questions. Thus the methodologies have to be determined in a relation to the data and data has to be gathered with the research questions in mind. The case(s) combined with the object of study defines what are the key data and methods whereas the researcher´s prior knowledge defines the object of study and research questions at the same time. In case study research these cycles are tied to each other and on constant interaction. (Laine, Bamberg & Jokinen 2007.) This circulation has been applied in this study, too.

The complexity of social life is the ongoing problem of research. It cannot be studied through simple research methods. In order to answer to this complexity, case studies have combined different sources of data, methodologies and a variety of aspects into a strategy named *triangulation* (Fig. 1). Triangulation helps in assuring the validity and reliability of the study. *Data* triangulation is based on different sources of data from which the material is gathered differently. Sources of data may include data from interviews, official documents and newspaper articles. Material may be completed with surveys and statistics. In addition participative observation may be used. However, the selected sources of data are not self-sufficient from the research methods. Thus the selected data affects the selected research method and wise versa. Hereupon data- and *method* triangulation are connected to each other. (Laine, Bamberg & Jokinen 2007.) Triangulation of data and research methods reduces deductions based on prejudices and analyses that lean on intuition (Salminen 2011). In practice this means that when a researcher is collecting research data she or he already has a notion of how to analyze the data. In method triangulation the research should be planned so that the weaknesses and strengths of each method used are recognized. Thus the methods may be used to complete each other. Moreover the methods should be selected based on their theoretical relevance. (Laine, Bamberg & Jokinen 2007.)

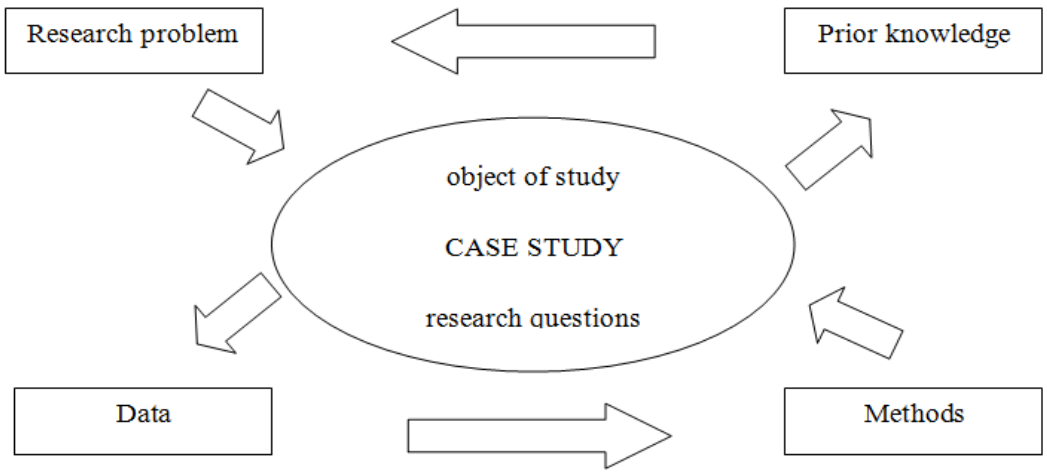

Figure 1. *Cycles of Triangulation* (applying Laine, Bamberg & Jokinen 2007; Haila 2006)

2.2 Framework and Empirical Sources

The framework of this study is in knowledge-based economy (chapter 3). To study innovation platforms in regional knowledge economy operational environment has to be fused. Thus the framework of this study is studied from two different points of view. First, it is related to diversification of knowledge base and its relation to innovation activities and second, to that the emphasis in knowledge creation is turning from individual activities to joint knowledge creation and transfer in communities and other social structures.

The framework is carried further with a literature review (chapter 4.1) of globalization of innovation communities and thus the concept of innovation community is defined. The empirical part consists of three different data sets and different research methods applied to them:

(1) Screening over existing innovation communities in Finland (chapter 4.2)

(2) Research material from a survey established in Demola an innovation platform located in Finland (chapter 5) and

(3) Fieldwork in Microsoft Innovation Centers in Brazil (chapter 6).

I have applied different methodologies to support the object of study and set research questions. The discussion and conclusions of the study are concerned in the last part of the study (chapter 7). The last part will also give some notes on the methodology.

Data triangulation is based on different sources of data. I have gathered the data differently based on what has been the best suited practice in every occasion (described below). Also the methods used complete each other (described below). Knowledge economy as theory and innovation communities and platforms as key concepts completes the data and methods chosen as it has also suggested their selection in the beginning of the research. It is to be noted that different parts of the study have been implemented as parts of bigger research projects (see references). However, combination of these relatively separate sources of data has been executed by the author. The selection of what to include in this study has been diffused based on that the parts complete each other. Moreover in some parts of the research the sources of data have led to learn more about specific themes, which in turn has led to new sources of data. In each part of the study the methods applied for the different sources of data and set research questions have been determined based on the objectives of this study. The multiple sources of data and the combination of these analyses enable the methodology of this study to be extensive, which in

turn helps ensuring diversity in the material description and thus provides better comprehension of the phenomenon and circumstances. Hence a picture of the role of innovation platforms in the integration of global talent into regional innovation activities is enhanced.

Next I will discuss the validity and reliability of the data and methodologies in (1) the literature review, (2) screening, (3) Demola survey and (4) fieldwork in Microsoft Innovation Centers individually. Validity means to what extent the analyzing method matches with the research data, whereas reliability tells how well the method works in analyzing the data. These are important factors in making the research process ratable and the conclusions made easy to follow. I aim to illustrate the data, deductions, decisions and interpretations I have made as precise as I can. Based on the this illustration the validity and reliability of the study may be estimated.

2.3 Literature Review

Literature review assists in combining results from different researches to create ground for new results. As a methodology, literature review targets at regenerating and estimating the existing theory. The methodology helps in defining the general overview of the studied phenomenon and recognizing any problematic the phenomenon may include. Additionally literature review provides a possibility to illustrate the development of a theory or a concept. (Salminen 2011.)

Literature review in this study is based on a model of a *systematic literature review* that is focused on a research question that tries to appraise, select and synthesize evidence related to it (Salminen 2011). Fink (2005) has illustrated systematic literature review with a seven-step-model. First the research question is set and then the databases and research concepts are determined. With the careful selection of the research concepts the results are defined to match with the research question. The practical screening of the results ensures that the results are estimated in a methodological sense. Hence the data responds the scientific quality of the research. Conducting the review with a standardized model assists the material gathering from the articles. Last the results of the literature review are synthesized. (ibid. 2005.)

The concept of innovation community has been used to illustrate the importance of interaction and collaboration. However, this has only been done vaguely and the concept has remained fuzzy and it has been used in rather diverse meaning. With the literature review I wanted to clarify the definition and understand the globalization of innovation activities better. It was also

in my interests to find out how knowledge was exchanged in these communities and what the incentives to do so were. These are important factors when considering the creation of knowledge and thereby increasing the level of *human capital*. Thus a literature review[2] was conducted to understand the globalization of innovation communities better. The key questions addressed were:

- *How was knowledge exchanged in the communities and what was the incentive?*
- *What was the level of globalization in the communities?*

The literature review was conducted by using the Web of Science by Thompson-Reuters. The review was conducted in June 2012 and in the searches the concept *innovation community* was related either with *globalization, internationalization or trans-nationalization.*

Search criteria were the following:

- Search topics were **innovation** (innov*) and **community** (communit*) in connection with
  - global/globalization/globalizing (glob*) or
  - international/internationalization/internationalizing (internat*) or
  - transnational/transnationalization/transnationalizing (transnat*)
- These three searches were refined by Web of Science Categories on
  - scientific disciplines (management, business, planning development, economics, public administration, operations research management science, urban studies, geography, social sciences interdisciplinary)
  - document type (article)
  - language (English)
  - time-span for content analysis from 2000 to 2012
  - time-span for citations calculation from 1986 to 2012
  - databases were SSCI (Social Sciences Citation Index) and A&HCI (Arts & Humanities Citation Index)

[2] The literature review was conducted as a part of a Tekes funded project Enabling Innovations beyond National Innovation Systems (IBIS 2011–2012, Tekes) in the Research Center for Knowledge, Science, Technology and Innovation Studies (TaSTI), School of Humanities and Social Sciences, University of Tampere.

The searches for content analysis resulted with 287 articles (glob* 169 articles + internat* 104 + transnat* 14). The three conducted searches focused on the articles published from 2000 to 2012. In order to study the longer history of the topic I conducted more searches with a wider time-span; 1986 to 2012. The results showed that the first related articles were published in 1994. A growing interest towards the study field may be seen from the increased number of annual citations. To screen out the most relevant articles related to the phenomenon I created a standardized model by using a *frame*[3] to map certain features from the articles.

To define the concept innovation community further I handpicked ten articles based both on the total and average citations (per year) and the relevance of the articles (the relevance was deducted from the material gathering by using the frame). Analyzing these ten hand-picked articles gave a valuable addition to understand the globalization of innovation communities. To synthesize the articles I created a chart to map out certain features about how innovation communities and their globalization were experienced in the articles.

The literature review contributes to defining innovation communities and their globalization but it is worth noticing a few weak points. Firstly, some of the articles were represented more than once because they came up in more than one search. However, it would have been impossible to conduct the review otherwise using the Web of Science. Secondly, there might be some newer yet relevant articles, which are not taken into account here because they have not had time to be cited yet. Thirdly, it is worth while to note that using only the Web of Science in sample-forming may not provide all the relevant articles written about the topic.

Furthermore the literature review here is focused on international peer-review articles and albeit they offer a valuable source of knowledge other sources of data were hereby ruled out. This data might include sources such as reports from expert organizations, general government, international organizations and other research literature. Narrowing the language only to English may exclude relevant articles published in other languages. However, this was the only option available given the language skills of the author. Nevertheless, Web of Science offers a good tool to find at least some of the essential articles and this way underline the importance and the growing interest in this research field.

[3] See appendix 1, Table 1. *Frame to deduce the relevance of the article.*

2.4 Screening

Screening is a method deducted from medicine where it has been used to recognize diseases from population. Here, the method is adjusted to identify *innovation communities* from the mass of communities in Finland[4]. The small screening maps different kind of innovation communities that link foreign-born people into innovation activities. There has not been equivalent research upon the topic and even though this screening helps in mapping the existing innovation communities in Finland further research is still needed. The key question of the screening was:

- *What kind of innovation communities there are in Finland facilitating the integration of foreign human capital into innovation activities*?

The screening was conducted in two parts. (1) Interned search was conducted in February and March 2013 and (2) specifying interviews took place in June 2013. The internet search was executed by using Google search and social media (e.g. Facebook). The search topics were *innovation community* and *online community.* At some points also *Finland* was included to the searches. In addition, I used a snowball method to find as many innovation communities as possible (e.g. following references provided in various internet sites). The objective of the internet search was to gather up as many innovation communities as possible for later analysis and categorizing. The search resulted with about 40 communities. To formulate a more comprehensive picture of the operations in some of these communities I contacted twelve people involved with the communities to conduct *open interviews* in order to learn more.

Open interview as a research method is the utmost informal type of interviews. It uses open questions, which do not include structured answers. Thus open interview replicates a situation that is more conversation-like in nature. The questions are set based on the interviewees´ previous answers. (Hirsijärvi & Hurme 2001.) Thus the interviews may bring out topics the interviewer did not know to ask in the first place. The usage of open interview is beneficial when the experiences of the interviewees vary and the number of the respondents is not extensive (Metsämuuronen 2000).

The method was chosen here to understand more about some communities that did not have so much information about them on their internet pages. The interviews were assumed to assist in forming an authentic picture of the communities´ operations. Eleven of the interviews were

[4] The screening was conducted as a part a research project *Towards Inclusive Use of Intellectual Capital,* (INCO 2013-2014, Tekes), as a collaboration of School of Humanities and Social Sciences, University of Tampere and Management School, University of Tampere.

conducted over phone and one was a face-to-face meeting. Most of the interviews were phone interviews because of long geographical distances. In the interviews the interviewees were asked to describe their community in general (e. g. how the community was established, who were involved in the community: international people vs. Finnish members). The content of the interviews was then analyzed according to notes made during the interviews (the interviews were not recorded).

The small screening draws a sufficient but a rather narrow picture of the existing innovation communities in Finland: There might be more communities, which did not come up in the search. Albeit according to the screening innovation communities could be labeled into different types and thus understanding of different innovation community types was increased.

2.5 Demola

Demola as an innovation platform is an acknowledged actor in Tampere region (Finland). Furthermore it came up in my search in the screening, too. Demola involves students from three universities located in the Tampere region[5] in its multidisciplinary and multinational projects and connects students with companies and local business life. Beside the Finnish degree students there is also a number of international students involved in Demola projects. The data for this part of the study consists of two surveys[6] conducted for students that took part in a Demola project in 2012 (the first survey was for students that took part in Demola during the semester and the second for students that were involved in a project in the summer). Surveys were executed as a part of a research project and thus the questionnaire[7] was formulated to match with the objectives of the project. Nevertheless the data could be used to support also the research questions set in this study.

Survey as a method is probably the utmost spread form to gain access to such data that describes the opinions and attitudes of a large population. As a method it is commonly used to observe the relations between different variables. Usually it is used to produce information of how groups

[5] The University of Tampere, Tampere University of Technology, Tampere University of Applied Sciences

[6] The surveys were executed as a part of WAVES-project with the support of Academy of Finland (Grant 255 454) and the European Research Area WORK-IN-NET project through the Finnish Work Environment Fund (Grant 109 182). The implementation of the survey is reliant to the work of Ilari Karppi and Tiina Ramstedt-Sen to whom I want to address my compliments for access to the data.

[7] See appendix 2 for the questionnaire.

with different backgrounds respond to different things. Surveys may be used both on (1) extensive surveys in order to generate general overviews and as (2) feasibility studies for more specific studies. The principles of survey researches are that the survey is systematic and the data should be objective and quantitative in nature. The survey should represent extensively the whole population involved. Surveys are always targeted to a sample group if the group itself is so extensive that the whole population cannot be reached. Data gathered with surveys should always be observed free of the researchers´ interpretations. Thus there are some set requirements for the credibility of the data. Therefore the data is usually concerned as numeric. Surveys are best suited to study different situations, practices and circumstances and to make comparisons between different groups. (Anttila 1996.)

I gained access to the Demola data after the data assembling when the material was already codified. The material allowed me to create and focus on a matrix that best suited the phenomenon I was studying. The data consists of 107 respondents, who were all students participating a Demola project in 2012. The students were either involved in the project during the semester or in the summer. 96 of the respondents attended Demola during the semester in 2012 and the remaining 11 participated in the summer of 2012. The questionnaire used during the semester consists of 36 questions and the one assigned for the students participating in the summer has 34 questions. There are two extra questions for the students participating during the semester, which concern summer jobs. Because the 34 questions were the same for both groups I combined the material from the two surveys.

The questionnaire consisted of different types of questions. In some, the respondents had to choose the best suitable option and some were open questions. As the questionnaire was not drawn to match with the objectives of this study I did not take into consideration all the questions addressed in the survey. This study is only focused on questions that support the set research questions and therefore some themes from the questionnaire were ruled out. Even though the questionnaire was not designed for this study it offers a valuable source of data and enables to reflect the data to work in favor of this research.

In the survey the respondents were asked to specify their student status from three options: (1) *international degree students*, (2) *exchange students* and (3) *Finnish degree students.* This labeling made the core of this study. The international degree students and exchange students represent a sample group of foreign-born people participating regional innovation activities (i.e.

global human capital). Their responses are compared to each other but also to the Finnish degree students in order to learn whether the background of a student influences the integration process.

From the 107 respondents 23 percent were international degree students, 16 percent were exchange students and 61 percent were Finnish degree students (Fig. 2). The number of international degree students was 25 from whom 17 were men and 8 women. Of the 17 exchange students 14 were men and 3 women. The number of Finnish degree students was 65 and 49 of them were men and 16 women. 75 percent of all the respondents were men and 25 percent were women (Fig. 3). Even though the numbers in the international degree student and exchange student groups were not big, these two groups were kept separate due to the assumption that their student status and relationship to the local university might affect the integration process. Moreover, there is also a difference in the length of their stay in Finland. It was assumed that this might create differences in the integration processes. By keeping the groups separate this could be observed in the data analysis. The differences between the student groups is illustrated by the presentment of multiple figures drawn from the data (see chapter 5).

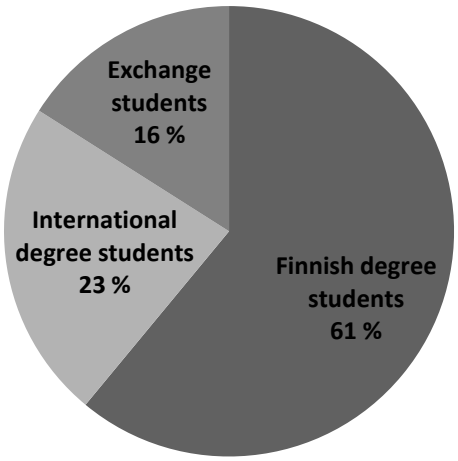

Figure 2. *Students groups among the respondents (N 107)*

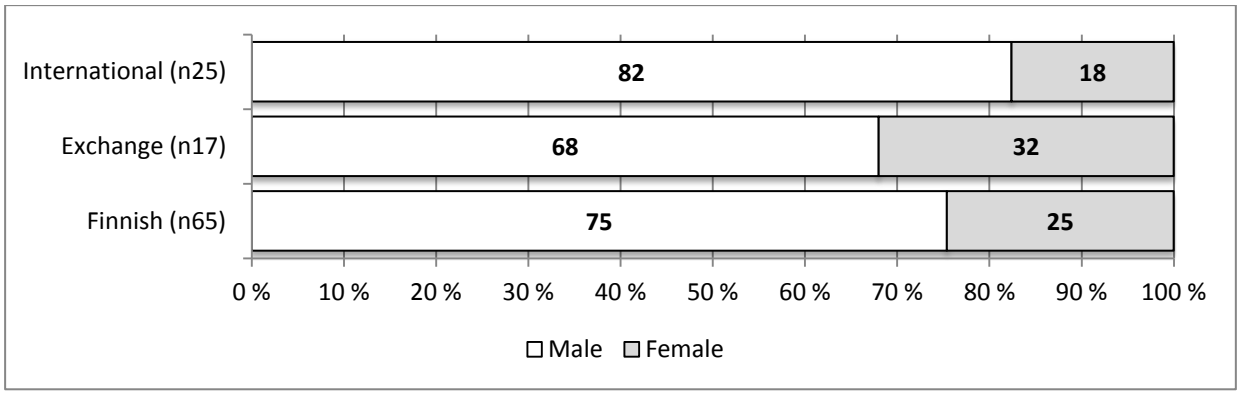

Figure 3. *Men and women among the respondents (N 107)*

The data gathered with the survey enabled focusing and comparing the integration of international and Finnish students. Therefore the Demola case supports the research upon how global human capital may be integrated into Finnish knowledge economy. Based on research diversity of knowledge base may create competitive advantage for a region and support economic growth. Moreover research has showed that young, highly-skilled people are the perfect target for countries to attract global talent. Therefore the foreign-born students participating Demola represent the highly-skilled foreign talent that may be important for knowledge-based economic development in Tampere region. Thus the research questions of this part of the study were:

- *How students integrate into innovation processes through innovation and development platform Demola?*
    - *Are there differences in the integration processes between the international and Finnish students? If yes, why?*

The strength of the survey is that it enables comparison between international and Finnish students even though the sample group is small and in parts the questionnaire may be found ambiguous. However, although the sample group is small, and therefore any statistically significant conclusions cannot be made from the results, the research data established a picture of the student groups´ integration processes in relation to each other. Even based on the small student groups it may be compared how a Demola project has been involving students with different background in innovation activities. In addition, even though the research data was quantitative it included qualitative elements (open questions). By categorizing these answers into groups I could create a relatively extensive sample group of students with a foreign

background. Thus the data is valuable in creating understanding of the integration of global human capital in regional development as a phenomenon.

2.6 Microsoft Innovation Centers

As a point of reference I studied Microsoft Innovation Centers in Brazil[8] to learn more about the locality of global knowledge economy. I aimed to understand what kind of innovation practices there are in a leading global company. There are about a hundred Microsoft Innovation Centers worldwide through which Microsoft has established access to local markets and thus taken advantage of the local knowledge. The aim of this part of the study is to understand how a global pioneer in innovation platforms is executing the activities in a local level and how global is linked with the local level: how Microsoft has established access to the local market in Brazil and has utilized local knowledge there. I studied different incentives and motives the local players had to be involved in the operations. They key question addressed was:

- *How global and local are linked together in a pioneer innovation platform?*

This was supported with three specifying questions:

  - *How global innovation platforms may facilitate growth in a regional economy?*
  - *How global innovation platforms participate to community-building practices within a region?*
  - *How local knowledge is utilized to benefit global means?*

To create an authentic picture of the processes Microsoft has established, I visited three Microsoft Innovation Centers in Brazil in November and December 2013. The three centers were Belo Horizonte, Sao Paulo and Fortaleza that are all located in different parts of Brazil. Every location reflects a different economic structure. I met eleven key characters with whom I had arranged a meeting beforehand. The interviews were recorded and after transcribed and then analyzed. Participative observation was used to support the interview data.

[8] The research in Brazil was conducted as a part of a research project *Towards Inclusive Use of Intellectual Capital* (INCO 2013-2014, Tekes) as a collaboration of School of Humanities and Social Sciences, University of Tampere and Management School, University of Tampere.

The methodologies used were *thematic interviews*[9] and *participative observation*. As a method thematic interview sets between a survey and an open interview. The interview does not proceed through specific questions that are formulated beforehand but loosely connecting themes designed prior to the meeting. However, theme interview is a more structured way of conducting an interview than an open interview because due to prior research and familiarity with the topic the themes are the same to all the respondents even though moving between them is flexible and does not require a specific order. (Hirsijärvi & Hurme 2001.) Participative observation may be either active or passive in nature. In the active form of observation, the researcher may be involved in development work or a project as an active member whereas the passive form refers to situations where the researcher is present but not influencing the process. (Anttila 1996.) My participative observation in the centers sets into the latter category.

Microsoft Innovation Centers provided valuable insight into how global innovation platforms function. The data formulated an authentic picture of their every-day-life. This part of the study supports the importance of understanding cultural offsets of innovation platforms and attributes to pointing out to what direction should innovation platforms be developed. Conducting research in the centers also contributed to forming a picture of how global innovation platforms are attached to local ecosystem and what are the key features in creating a successful concept.

[9] See Appendix 3 for the interview questions.

3 KNOWLEDGE-BASED ECONOMIC DEVELOPMENT

The roots of Knowledge-Based Economic Development are in the early twentieth century. Already in 1934 Shumpeter acknowledged that *knowledge and innovation* are the keys to *economic development.* Fifty years later Romer (1986, 1002) wrote how *human capital* is different from other forms of capital in a way that it can grow without limits. In 1990 Porter suggested the idea of competitive advantage of nations, in which national competitiveness depends among other factors on the production structure of the nation. At the same time Romer (1990) proposed *the new growth theory*[10], which focuses on (1) knowledge and technological progress and (2) knowledge by the implementation of human capital. The New Growth Theory suggests that investments in knowledge and human capital generate growth through knowledge spillovers and therefore the policy implication is that investments in knowledge and human capital are the best ways to stimulate growth (Landström 2008).

Romer (1993, 562) summarizes the core of knowledge-based economies by stating that research, inventions and innovations are overwhelmingly important factors for economic growth. Lundvall and Johnson (1994) call this new economic operational environment the *learning economy*. Learning economy is characterized with high usage of ICT specialization, and innovation is the key factor in creating competitive edge. Learning is the central ability in this new environment. (Lundvall & Johnson 1994, 26.) Hereupon it may be seen that the operational environment of urban development activities is changing from national to global and learning in development networks is becoming increasingly important and even essential for urban regions. The operational environment is comprised of two main factors, which are that global competition is intensifying and it has been mainly innovations that create economic growth. Consequently urban regions need to develop in a more modified way in order to create new kind of competitive edge. Furthermore competitiveness[11] of an urban region is its ability to attract flows important to its development. (Kostiainen 2002.)

[10] About the New Growth Theory see Paul Romer (1986, 1990) and Robert Lucas (1988).

[11] Kostiainen (2002) defines competitiveness as "an urban region´s ability to attract the flows of information, technology, capital, culture, people, and organizations important to it as well as its ability to maintain inhabitants´ quality of life and living standards and t create innovative environments that enable the companies operating in the urban region to promote their own competitiveness". Before the concept of competitiveness has only been linked to companies, but during the past twenty years it has also been linked first to nations (see e.g. Porter 1990; Kostiainen 2002) and then also to regions (see Kostiainen 2002). According to Linnamaa (1999) the competitiveness of an

From the economic point of view knowledge[12], innovation and learning have become the central factors of driving change and research (Romer 1993). Whereas Romer (1993) recognized already twenty years ago that inventions and innovation are the core of economic growth, the role of innovation and the creation and use of knowledge have become even more significant drivers of economic growth in the *knowledge-based economy* (Landström 2008). Powell and Snellman (2004) define knowledge-based economy as "production and services based on knowledge-intensive activities that contribute to an accelerated pace of technical and scientific advance, as well as rapid obsolescence". They argue that the key component of knowledge-based economy is a greater reliance on intellectual capabilities (not physical inputs or natural resources); technologies based on knowledge and information production and dissemination have become the key drivers of development and change (ibid. 2004).

Knowledge-based policy has been used by many nations to improve national competitiveness. As the role of information technology has been highly important to the development of knowledge-based economy Chen (2008) argues that in the knowledge economy *innovation* is the most critical factor to create *economic competitiveness*. In addition the innovation capital of national knowledge-based economic development depends on various factors. These have to do with the performance of the national innovation system, which impact on the effectiveness of innovation, application, and proliferation of knowledge. In other words this means that a nation needs both excellent human capital with innovative knowledge ability to help innovative activities and effective information technology to help the circulation of knowledge. These combined with powerful political and socio-economic environment create a strong competitive edge for a nation. (ibid. 2008, 511.)

Hereupon it may be determined that *knowledge-based economy* is built on innovation and human capital, and strongly related with globalization and technological progress, in which knowledge is the key factor to boost growth. Knowledge is always generated in a social context and this makes studying knowledge networks and innovation communities important.

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urban region consists of six elements: infrastructure, human resources, quality of living environment, institutions, efficient development networks, and membership in networks.

[12] It is important to tell the difference between knowledge and *information*. Classical definition of knowledge describes it as a truth or justified belief; whereas information does not necessary reflect these features. Therefore knowledge can be described as information that has been given a meaning or certain significance. (Kostiainen 2002.) Whereas *information* is facts, data and statistics and codified and explicit in nature, *knowledge* is more abilities, skills and expertise and not easily codified and implicit. The difference between information is that knowledge is produced by the human brain when information may also be stored in computers and printed out. (Román 2002, 37.)

3.1 Innovation in Knowledge-Based Economy

Innovation may be characterized as a part of business strategies where ideas are turned into value. Innovation generally means improved goods, services or processes, which sustain growth. Innovation can also imply to broader challenges, perhaps in the means of developing networks of researchers across disciplines and countries. In this way innovation may be seen as knowledge creation where human capital is its basic input. (OECD 2010.)

Studies show that innovations generally occur when combining different knowledge bases and expertise and that the diversity of opinion is a way to increase knowledge (Nahapiet & Ghoshal 1998). Furthermore Nahapiet and Ghoshal (1998) argue that knowledge exchange is the prerequisite for combining recourses. The rapid development of information and communication technologies has enabled new forms of knowledge transfer (Nås, Ekeland, Svanfeldt & Åkerblom, 2001, 72). Nahapiet and Ghoshal (1998) consider that the generation of human capital, is done through processes of knowledge combination and sharing experiences of different parties. They note that new knowledge may also accelerate from accidental and unplanned combinations of knowledge processes. They also add that even though the environment would provide opportunities for knowledge exchange and to the combination of knowledge, parties engaged must be motivated and have the capability to combine information or experiences. (ibid. 1998.)

Innovation is driven from increasingly complex interactions at local, national and global levels with the participation from individuals, firms and knowledge institutions. Literature suggests that investments in new knowledge (i.e. intangible assets) contribute to growth not only in the short period but also in the long run. (OECD 2010.) Therefore innovation should be seen as a long-term interactive learning process, which includes firms, research centers and producers, and in which a wide scope of institutional factors intervenes (Alburquerque et al. 2002, 62).

Smith (2001) sees that innovation is generated through the activities of skilled personnel such as researchers, engineers and managers. He also states that innovation is a *social process*, which involves *people* with knowledge, skills and competences (ibid. 2001). It is also important to understand the diversity and linkages of innovation actors and processes. These processes require communication and co-ordination and by enabling people throughout the economy and society to participate in innovation, it will provide new ideas, knowledge and capabilities, and enhance the influence of the market demand innovation. (OECD 2010, 15 – 44.) Tacit knowledge is at the

core of the innovation process (Nonaka & Takeuchi 1995), which in spite of all the new technology, is only mediated through face-to-face interaction (Kostiainen 2002).

Innovation may also be seen as a result from a range of complementary assets such as software, human capital and structures in the organizations (OECD 2010). According to OECD report (2010) investments on these intangible assets were increasing in Finland in the twenty-first century compared on the investments made on physical capital (machinery and equipment)[13]. There are mixed modes of innovation for most innovative firms introduce a wide range of innovations: both product and process innovations, as well as marketing and organizational innovations. Additionally collaboration in innovation has increased within firms for according to surveys in most countries collaboration with foreign partners has become as least as important as domestic co-operation. Moreover, *entrepreneurial talent* is considered to be critical in turning ideas into value. (OECD 2010.)

Also *education systems* play a significant role in supporting innovation because people need the capacity to continuously learn and upgrade skills in order to innovate. In addition *human mobility* has been recognized as an important asset for innovation for human mobility leads to diversification of a country's cultural stock and the importance of human mobility has been acknowledged especially among researchers and professionals with whom the mobility helps them to keep up with the advancements of their field (OECD 2010, 52–53). The mobility of the *highly-skilled* people is an important mechanism of knowledge transfer and it creates important linkages in innovation (Svein et al. 2001, 72). Human mobility contributes to the creation and diffusion of knowledge, particularly tacit knowledge, which is shared more efficiently within a shared social and geographical context. Knowledge circulation should be assisted by making coherent and efficient migration. The *mobility of the highly-skilled* implies to the knowledge flows across disciplines and sectors. Although, it may be hard to measure the tacit knowledge for instance students and workers bring with them. (OECD 2010, 15, 44–45.)

New knowledge may be created through incremental change and development from existing knowledge or through a more radical change in the means of innovation. These both types of knowledge creations involve making new combinations incrementally or radically. (Nahapiet & Ghoshal 1998.) *Open innovation* has been seen as a new way to create competitiveness in the knowledge-based economy. It has been argued that open innovation environments should be

[13] However, the investments on physical capital have been low in Finland and therefore the relation between the investments on intangible assets and physical capital may give such results.

favored in national policies to improve collective learning and knowledge innovation. (Chen 2008.)

Recent researches show that cultural diversity[14] and differences in knowledge and capabilities of workers from diverse cultural backgrounds may enhance innovation and economic growth in the means of different views, which can help in forming new ideas and operational models (Niebuhr 2010). Fujita and Weber (2004) argue that cultural diversity of the labor force might be of a special importance for R&D activity since the generation of new products and ideas heavily relies on individual talents and skills from diverse educational and cultural environments. Also Alesina and La Ferrara (2005) argue that cultural diversity may lead to innovation and creativity since it involves variety of abilities and knowledge. Additionally, cultural diversity is seen to make a country more tolerant (ibid. 2005). Therefore it may be understood how the attractiveness of a region for highly educated workers has rapidly gained importance for the long-term growth prospects and labor market performance (Burkert, Niehubr & Wapler 2008).

3.2 Human Capital, Competences and Diversity

Human capital is often seen as the key factor to enhance economic growth[15] and to reduce social inequity in the OECD countries. Human capital may be seen as the intangible assets that enhance or support productivity, innovation and employment. Although human capital refers to the importance people have gotten in the sense of knowledge and competence based economics, human capital cannot only be seen to be in favor of economic welfare for it may also imply to promote individual, social and economic well-being. (OECD 1998.) OECD (1998) defines human capital as "the knowledge, skills, competences and other attributes embodied in individuals that are relevant to the economic activity". Also Aldisert (2002) defines human capital as the skills and knowledge of people. She describes that in the concept of human capital, *capital* refers to something that might improve or enhance organizations´ wealth in a certain way (e.g. money or property) whereas *human* implies to the *competences* people in a specific organization have that might be turned into profits. (ibid. 2002, 3.)

[14] Diversity might refer to economic diversity, i.e. heterogeneity of firms and industries, or to the diversity of people (Niebuhr 2010).

[15] *Economic* may be understood as everything that enhances directly or indirectly wealth or income (OECD 1998, 9).

In recent literature *competence* has been used as a term to imply to the requirements an individual needs to properly perform a certain job. Competence is embodied in the collective experience and activities of people who produce and implement a new technology. (Smith 2001, 8.) Competences may be divided into general and high-level competencies, in which the *general competences* are considered to be important in the absorbency of new technologies whereas *high-level competences* are critical in knowledge creation. (OECD 2010, 45.) Mirabile (1997) defines competence as "a knowledge, skill, ability, or characteristic associated with high performance on a job, such as problem solving, analytical thinking, or leadership". He also adds that some definitions of competence include motives, beliefs and values (ibid. 1997). Parry (1996) sees competence as a cluster related to knowledge, skills and attitudes that affect in a great extend to one´s role or responsibility.

Schein (1978) recognizes five main categories of competences: (1) autonomy/independence, (2) security/stability, (3) technical-functional competence, (4) general managerial competence, and (5) entrepreneurial creativity. However, according to Mintzberg (1989) competences may be categorized into three major types, which are decisional, informational and interpersonal. In Mintzberg´s model the *decisional* category involves using information where the *informational* category in turn has to do with processing information, and the *interpersonal* category concerns providing information and ideas. Also Chandler and Jansen (1992) divide competences into three categories: managerial, technical-functional and entrepreneurial. Even though different competence types are recognized Parry (1996) questions whether a competence is something that may be taught, for despite the increased popularity of the concept, some researchers still argue that there is no widely accepted definition for it (see e. g. Stoof, Martens, van Merrienboer & Bastiaens 2002). Despite the debate on the definition, competence may be understood as different abilities people have in the sense of enhancing their performance inside an organization.

The concept of human capital has a more stabilized role in literature compared to the concept of competence. Human capital has been familiar in the economics for the past thirty years (OECD 1998). Whereas the value of human capital was at first acknowledged in human recourses, now the concept has been generated into many fields of science (Aldisert 2002, 3). There are implications that human capital may influence a country´s international competitiveness (OECD 1998, 10). Human capital is essential for *development* because education and training contribute to the generation and adoption of new technologies, and because education has clear impacts on productivity (Alburquerque et al. 2002, 101). Becker, Murphy and Tamura (1994) estimate that

the rates of return on investments on human capital rise when the stock of human capital increases. This is seen when education and other sectors that produce human capital use educated and skilled people more intensively than sectors that produce consumption goods (ibid. 1994). Research also implicates that human capital should be renewed on regular basis because in the globalized world knowledge gets old faster than in the past decades. This has lead to the adaptation of *lifelong learning*, where both *knowledge* and *competences* should always be updated. This way the relationship between human capital, competences and economic success is maximized. (OECD 1998, 10, 91.)

Knowledge spillovers and cross-fertilization of ideas are important sources of innovation and economic growth. When people from different backgrounds interact, new ideas can be produced and they may lead to economic growth (Glaeser, Kallah, Scheinkman & Shleifer 1992). Research shows that in order to generate knowledge spillovers, there must not only be investments on knowledge but also on the diversity of people i.e. cultural diversity. Cultural diversity may enhance entrepreneurial activity because diverse economic agents will response to new ideas differently based on their different values and cultural heritage. This has positive impacts on new firm formation especially in the means of technologically oriented start-ups. (Audretsch, Dohse & Niebuhr 2010.) Niebuhr (2010) takes also into account that the immigrants´ impact to a country´s innovation activities depend on whether they are skilled or unskilled. Niebuhr argues that attracting highly-skilled migrants is important in order to foster innovation and economic growth. She states that "presumably foreign and native workers of the same educational level are imperfectly substitutable groups because of cultural differences" (ibid. 2010). It is the interaction between heterogeneous skilled workers that gives rise to knowledge spillovers and produce new research ideas (Keely 2003), for knowledge production relies heavily on the talents and skills of employees coming from a wide range of cultural backgrounds (Fujita & Weber 2004). Also Burkert et al. (2008) argue that it is the highly-skilled foreigners that foster growth and improve labor market conditions within a country. Therefore countries must understand cultural diversity as a benefit (ibid. 2008).

Globalization of society, economy and knowledge has increased also the importance of *regional resources* as a source of competitive edge (Alburquerque et al. 2002, 60). Innovation development is unevenly distributed across nations for some regions seem to provide more conductive environments for innovation than others. Therefore policy makers in their regions seek to replicate the positive environmental conditions the best-performing regions offer (OECD

2010, 35) and to increase their knowledge base and strengthen the potential resources they behold (Alburquerque et al. 2002, 60).

Over the last decades there has been a rapid internationalization of higher education, when countries have simultaneously started to promote the immigration of the highly-skilled into to their economies. Countries and regions are realizing that the ability to attract and retain highly-skilled migrants is becoming significant in the means to remain competitive edge in the global economy. With this global competition of human capital the international students have become the attention of policy-makers at national and regional levels as the potential source of talent and therefore the foreign students are widely seen as the ideal highly-skilled immigration candidates to retain. This has also resulted in the change of the role of universities where they before were the providers of higher education but now they are also attracting foreign students. (Suter & Jandl 2008.)

There are many social, economic and political reasons why countries and regions want to attract international students. Student mobility has been seen as a way to improve the relations between the receiving and the sending countries[16]. The welcoming country may gain monetary benefits (e.g. tuition fees) and the contribution of the international students to the knowledge creation and transfer. International study environment may also be seen to have direct positive impacts on the national students, as it is believed that international environment increases flexibility in the labor market and hereupon also the national students may adjust better to the global competition of talent. (Suter & Jandl 2008.) Particularly some European Union countries have established policies and schemes that promote student mobility to increase intercultural contacts and to build social networks. (OECD 2010, 52.)

Moreover young people are more likely to move between jobs than older professionals and therefore they make a valid target for countries to lure global talent. International mobility of highly-skilled people is driven by a variety of motives ranging from personal and family considerations to academic and job-related reasons. Finding the right balance between the labor specific skills and general competences is a challenge for every higher education facility around the world. However, also the educational attainments have to match with the demand of highly-skilled personnel for in fact there are differences in the supply and demand for highly-skilled

[16] For example, promoting exchange and acquaintance with other European cultures is one explicit goal of ERASMUS, the EU program for furthering international student mobility (Suter & Jandl 2008).

employees in most OECD countries. Nevertheless getting people to the labor market is crucial to foster innovation, economic growth and social well-being. (OECD 2010, 50, 52.)

3.3 Social Capital in Knowledge Creation

It is argued that in order to obtain highly-skilled human capital, high level of *social capital* is required (Román 2002, 45). Nahapiet and Ghoshal (1998) suggest that social capital has an important influence on the development of human capital. Social capital may be understood as networks and social ties, which provide access to recourses in the means of social relations. These relations work as information channels for people and may reduce the amount of time and investments that are usually required to gather the same amount of information. Therefore social interaction may make knowledge exchange cheaper and faster. (ibid. 1998.) Hereby, whereas human capital may be understood as the knowledge and skills of an individual, s*ocial capital* refers to aspects of social life (e.g. networks and relationships) that enable people to interact and work together. Hence there might be a relationship between social and human capital in a way that social capital enhances one´s abilities to acquire human capital. (OECS 1998, 10.)

Hereupon social capital may be defined as a collectively owned community asset or a public good that is intangible, inalienable and difficult to measure and complex in terms of defining its causal linkages (Román 2002, 34, 38–39). Social capital can also be defined in the terms of *trust*; trust in the community and its development potential and also trust to human capital that enables the members of a certain society to trust each other in order to co-operate, form groups and networks within them (Alburquerque et al. 2002, 66). Trust between the social agents facilitates co-operation and creation of networks and increases the feeling of security (Román 2002, 38).

Nahapiet and Ghoshal (1998) define social capital "as the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit". They also recognize three different dimensions of social capital, which are structural, relational and cognitive dimensions. Although Nahapiet and Ghoshal separate the three dimensions, they find them highly interrelated. Structural dimension refers to the wholeness of social system and networks of relations. It concerns all the linkages of people and units, whereas the relational dimension refers to the personal relationships. The cognitive dimension of social capital concerns making interpretations among parties involved. Because social capital is based on these forms of social networks and forms of friendship it is in

its nature that it cannot be traded easily. However, social capital may enhance the achievement of other objectives that might be impossible to reach without the social dimension or only with an extra cost. (Nahapiet & Ghoshal 1998, 244–245.)

Moreover, social capital may be seen as the synergetic sum of individual human capital that helps people to learn to innovate. Hereby social capital is an economic resource and a factor in production. Albeit social capital is firstly built on trust, also established code of conduct and institutional structures are important. The code of conduct may be written or unwritten and it might or might not be legal in nature. Institutional framework is required because the entire institutional structure must answer to the same principles of the social organization. (Román 2002, 34, 38–39.) Also regional development may be seen linked to the increase of social capital (Alburquerque et al. 2002) as social capital increases the efficiency of action and diminishes the level of opportunism. The latter may be seen as a consequence of trust. (Nahapiet & Ghoshal 1998, 246.)

Furthermore, human capital cannot be distinguished from *social capital*, and value of human capital as professional knowledge also depends much on how it matches with the socio-cultural background of the environment. Because both social and human capital develop from social interaction and relationships (Nahapiet & Ghoshal 1998) it is important that the networks and communities are built on trust for this supports the creation of social and human capital.

3.4 Linking with Global Knowledge Economy

Local activities are always dependent on the social environment and actors involved. Most importantly knowledge exchange is always related to the people who act from their own local offsets. Bathelt, Malmberg and Maskell (2004) have alleviated the importance of *locality*. They introduce the concept of *local buzz*, which means local activities and familiarity of the local conventions. They suggest that only by recognizing these local habits one may tap into the local socio-cultural environment. Also Raunio and Kautonen (2014) acknowledge that local level may obtain such characters that the state level may lack. These are related to the socio-cultural environment and access to it. These may be important qualities at an international level. (ibid. 2014.) Thus, even though the importance of locality is acknowledged, studies imply that knowledge creation is only enhanced when *local* is connected with *global*. Hereby it is suggested that knowledge is generated in the local level and then channeled forward through global

pipelines. (Bathelt, Malmberg & Maskell 2004.) According to Bathelt et al. (2004) being part of knowledge creation does not require particular investments: it is merely received automatically by those who are located in a region and who participate in the social interaction. Nevertheless the challenge is how an outsider may gain access to the local social interaction.

As pointed out innovation is increased when players from different backgrounds are brought together; when local is connected with global. However, mutual understanding and trust is increased with common history, related social capital and spatial and cultural proximities (Maskell & Malmberg 1999). A shared social structure is important for efficient use of tacit knowledge (Gertler 2003). Nevertheless local networks and proximity may also have negative outcomes that are related to the nature of how they may be exclusive to newcomers (Boschma 2005). Hence these are the problems that need to be overcome in the new operational environment. Innovation polices need to be planned so that innovation environments are rather inclusive than exclusive.

Despite the level of planning Maskell, Bathelt and Malmberg (2006) also remind that it does not necessary take a certain design and level of planning to reach outcomes when combining actors from different backgrounds together. In fact, all meetings that bring together international participant groups may be important for innovative activities (ibid 2006). Maskell et al. suggest that encounters do not always have be long-lasting in nature in order to lead to the exchange of knowledge but also brief contacts may stimulate innovation and lead to knowledge creation. Thus global pipelines may work even though they would only be temporary in nature. The brief knowledge exchange may lead to people taking the new knowledge with them to their own local level where they may share it with their fellow workers. Therefore it may be deduced that for example international trade fairs may also be an example of these kinds of global pipelines. International trade fairs bring together professionals from different countries and may thereby enhance knowledge exchange. (ibid 2006.) The actors in these affairs do not have to share a common cultural background for it is enough that innovation is stimulated and after the sharing of knowledge takes place in the local level in which the individual actors are attached to.

Hereby global pipelines may be seen to have a dual function. On the other hand they may function as a way to channel local knowledge forward and on the other they may pursuit global actors to tap into the local activities. In both occasions locality is important. In line with this Raunio and Kautonen (2014, 6) suggest that "national policies should provide a supportive institutional base for regionally embedded and anchored but functionally and socially globalized

communities". Thus global pipelines may be used to establish connections either to local activities, which is usually the case when big companies are pursuing local markets and for local actors to create global connections, that applies for example when small companies are reaching to tap into global markets. Either way same conventions hold. It seems that global pipelines tap people into selective environments and they have to be designed to match the environment and the people. In the next chapter I will carry on discussing the globalization of innovative activities by concentrating on *global innovation communities* and *platforms.* Thus I will bring together innovation, people and globalization.

4 GLOBALIZING INNOVATION COMMUNITIES AND PLATFORMS

Building of human and social capital can be approached by emphasizing the context of innovation communities and supportive innovation platforms as policy tools. Thus a more precise frame for the empirical study consists from innovation communities and innovation platforms as measures to support and facilitate the formation and activities of innovation communities.

Innovation communities are groups of actors, essential or supportive to the implementation of innovation processes, whereas knowledge-based economy is build on innovation and human capital, and strongly related with globalization and technology, all these factors are combined in innovation communities. Therefore, it was deemed important to conceptualize innovation communities and innovation platforms. In this chapter I also want to draw attention to globalizing innovation activities.

Next I will discuss innovation communities and their conceptual roots in literature. Then I will present a literature review of global innovation communities, which will take a look at the number of published articles related to the phenomenon and their annual citations, and after analyze ten hand-picked articles. The literature review will help to map the study field this far and, moreover, highlight the importance of the selected theme. The ten hand-picked articles were chosen based on the total and average citations per year. Also the relevance of the article was taken into consideration. I used a chart to map out certain features of how innovation communities and their globalization were experienced in the articles. They key questions were:

- *How was knowledge exchanged in the communities and what was the incentive for it?*
- *What was the level of globalization in the communities?*

After the literature review I will describe the results of a small screening conducted of the exciting global innovation communities with an internet search. When studying the enhancement of global diversification of human capital in Finland, it is important to learn more about what kind of innovation communities there are in general facilitating people into innovation activities. The key question of the screening was:

- *What kind of innovation communities there are in Finland facilitating the integration of foreign human capital into innovation activities?*

After presenting the screening and its results I move on to concern innovation platforms as the last part of this chapter. I will discuss how innovation platforms have been defined and discussed in recent literature. Moreover I will establish how they are connected to innovation communities, globalization and regional development.

4.1 Innovation Communities

Literature has discussed the relation between knowledge of individuals and knowledge of an organization. Organizational learning concerns the relation between knowledge of individuals and knowledge of organizations. It has been suggested that individuals and their skills and abilities enrich organizational learning. (Cohen 1991.) Traditional definition for learning is a shift in performance. Organizational learning consists of a process of acquiring common knowledge, beliefs or norms (Weick 1991). These learning processes include processes in which individually acquired skills and knowledge are accepted (Duncan & Weiss 1979). Duncan and Weiss (1979) have also acknowledged that the environment and the social relationships of the organizations´ members may affect knowledge creation. Thus the environment and social ties may enhance knowledge transfer when given favorable circumstances.

Nooteboom (2006) underlines the importance of *communities* as the intermediate level between individuals and organizations. Communities link together organizations and individual people in learning processes. Thus in communities links between individuals are achieved and hereby common knowledge is acquired. (ibid 2006.) Also Smith (2001) sees *innovation* as a social process. Innovation as a process involves people with knowledge, skills and competences. Thus these processes require communication and co-ordination between the people involved (OECD 2010, 15–44) for whom various networks and social relations work as information channels. These channels include also communities, in which knowledge may be exchanged easily and with a low investment. (Nahapiet & Ghoshal 1998.) Communities enable collective learning and knowledge innovation (Chen 2008). Also the new mode of producing scientific knowledge is shifting from individuals to *communities*, from single to multiple institutions, and from national to international. This means that researchers are increasingly networking beyond national and organizational boarders. (OECD 2010, 31–32.) Also experience based knowledge is becoming

more important and recognized feature (see e.g. Wenger 200; Wenger & Snyder 2000; Brown & Duguid 1991).

Communities create and support identities of people participating in them and they can be seen as bringing together a number of individuals who within the communities build a unified identity. The education on the communities´ members help in the formulation. This kind of conjunction of education and communities has become understood as the concept of *learning communities* (consider lifelong learning), which have become rather familiar in higher education. (Quinn 2010, 45–46.) Communities always include three connective elements, which are geography, interaction and human relations (Hillery 1955). Moreover communities are based on a sense of belonging, voluntariness and openness (Kangaspunta 2011). Aro (2011) specifies that the social bonds tying people together in communities may be either sentimental or interest-driven.

Innovation communities may be simplified as groups of actors, who are essential or supportive for the implementation of the innovation process (Lynn et. al 1997). Lynn et. al (1997) describe innovation communities as "the functionally integrated and interdependent set of organizations that are involved in commercializing a new technology. Members of the community can be identified by examining the sources and flows of vertical complementary assets and information used in the process of commercialization". Nordic Innovation Publication´s (2012) definition of innovation communities is that "innovation communities (InnoComms) are group of people who meet regularly, typically with skilled facilitation, to learn and share insights about the challenges of managing innovation and entrepreneurship. Participants in InnoComms build management capabilities and professional networks through this mutual learning and support, tapping into the knowledge and experience or people outside their own organization, industry or country". Nordic Innovation Publication (2012) also divides innovation communities into five divisions which are (1) government-supported agencies, (2) university-based groups, (3) business executive groups, (4) nonprofit organizations focused on independent entrepreneurs and (5) groups of government or nonprofits sharing best practices. It is worth pointing out that the international connections in the innovation communities support the creation of different approaches on innovation which may enrich these activities. In order for these networks to be functional they always need to be established on a high-level of trust. (ibid. 2012.)

The conceptual roots of innovation communities are in the *communities of practice* (COP), *user-based open source communities* and *open innovation*. Communities of practice refer to groups of actors that share the same interest and wish to solve a problem after which the community may vanish (Wenger & Snyder 2000). Brown and Duguid (1991) describe communities of practice as groups built around an identity defined by a shared domain of interest. Wenger and Snyder (2000) define communities of practice as groups of people who share common expertise and passion for the same subject, and who exchange their experiences and knowledge in free and innovative ways. Their interaction is informal and it takes place either in regular meetings or plainly via e-mail networks. Communities of practice do not usually have a specific agenda and even if they do they might not follow it. (ibid. 2000.) Wenger (2000) presents three key dimensions of communities of practice to be (1) mutual engagement among participants, (2) joint enterprise and (3) shared repertoire.

Von Hippel described (1988) how users instead of manufactures are sometimes the drivers of innovation in some industries. In *user-based open source communities* users have a double role as both the developers and the users of the innovations. These communities are formed outside of entrepreneurships and they are based on producing user innovation in a scattered internet-based R&D. (ibid. 1988.) The rise of internet in the 1990s fostered an explosion in the user-driver innovation in the form of open source software development and the in the involvement of the customer in the innovation process. Internet made also the global exchange of ideas easier (von Hippel 2004), which in turn has been the catalyst of open innovation, that involves volunteers in the attempt to keep their processes of innovation public (Fleming & Waguespack 2007). Fleming and Waguespack (2007) define open innovation communities as groups of unpaid volunteers who work informally, attempt to keep their processes of innovation public and available to any qualified contributor, and seek to distribute their work at no charge. When open innovation is practiced by an enterprise the innovation process is built so that it is involving information and resources also outside the firm for the role of customers is important to open innovation (Chesbrough 2003).

As the operational environment has been changing and it has lead to innovation processed inside firms and other organizations to change, too, it has become important to consider new roles for innovation communities. Nooteboom (2006) has acknowledged that diversification of knowledge base in innovation communities is not always necessary easy. There might be conflicts between the actors involved in their interests. Also possible tensions due to different cultural backgrounds and habits may take place. Moreover differences of power may danger the functionality of the

community. To avoid such incidents Nooteboom (2006) has suggested that the communities´ repertoire should be widened to allow the exchange of behavioral, organizational and professional competence to give more weight to more technical professional expertise. Alongside with this he has considered how on the contrary firms could include a wider variety of learning groups in their activities. (ibid 2006.) In fact, as acknowledged above, there has been a growing interest among companies to involve open innovation activities for instance in their product development. Firms have also stated to promote other new kinds of tools to involve more diversified groups of actors in their R&D processes[17].

In a sum, common to all communities that have an influence over the formation of innovation communities is that they are targeting at combining different sources of knowledge in order to solve a problem or create something new. Albeit the composition of doing this alongside with the key objectives of doing so may vary between the communities they are all innovative in nature, which relates to the emphasis of the knowledge-based economy. As it has been said *innovation* is the key driver of change and an evident factor in enhancing economic growth. Furthermore it may be boosted by combining different sources of knowledge. Knowledge is always exchanged in a social context that is strongly reliant on the local characteristics. Thus the culture, habits, language and other specific attributes of the region become of importance for the exchange of knowledge.

4.2 Literature Review and Analysis of Innovation Communities

I conducted three searches using the Web of Science by Thompson-Reuters in June 2012 in which *innovation community* was related either with *globalization, internationalization or trans-nationalization*[18]. The searches resulted with 287 articles (glob* 169 articles + internat* 104 + transnat* 14). The number of published items in each year had more than doubled in the first search from being 9 at average between 2000 to 2004 to being 24 in 2011 onwards (glob*). The number of published items had also doubled in the second search (internat*) from being around 5 at average between years 2000 to 2004 to reaching 17 published items in 2011. The third search (transnat*) also showed an increase in the number of published items for the number of published items was one in 2000 and two in 2011 (Fig. 4).

[17] This will be discussed further in chapter 5 .
[18]The figures do not show publications from the year 2012 because the search was only conducted in June 2012.

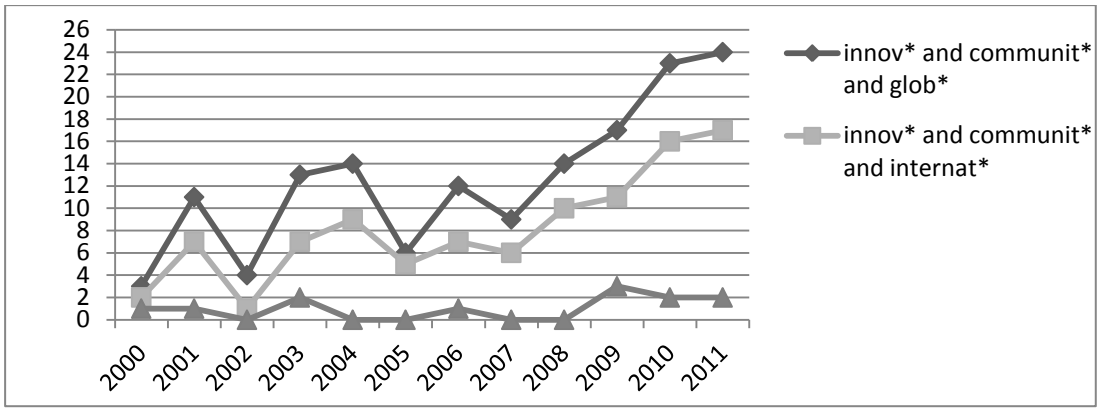

Figure 4. *Published articles annually from 2000 to 2011 (source: Web of Science)*

The three conducted searches focused on articles published in 2000 and onwards but it was also in my interests to study the deeper history of articles, which responded to the same search criteria. The results showed that the first related articles were published in 1994 (Fig. 5). A growing interest towards the study field may be seen in the number of annual citations. The number of citations in each year had increased in all the three searches in a more intense way than the number of published items. The first search (glob*) showed an increase from only a few citations before the year 2000 to over 560 in 2011. The second search (internat*) showed a similar patter; from only a few citations annually to over 300 citations in 2011. The third search (transnat*) differed from the other two; it did not have its first citations (nor publications for that matter) until in 2002. Within the nine-year time span from 2002 to 2011 the number of citations had increased to 36 citations per year.

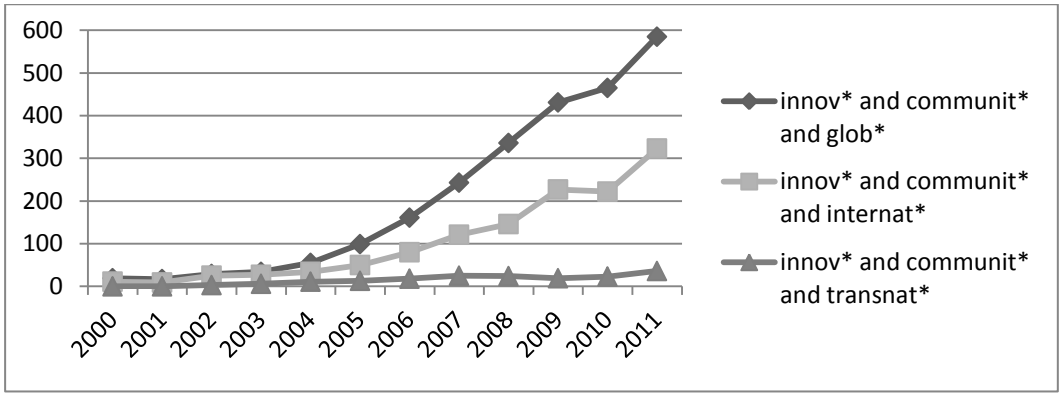

Figure 5. *Citations annually from 2000 to 2011 (publications 1994 onwards, source: Web of Science)*

Average citations per article (published items between 2000 and 2012) were 14.58 times (glob*), 11.75 times (internat*) and 13.43 times (transnat*). Searches with the terms global and international (or other forms such as globalization) had a significantly higher *number of citations in total* than the third search with the term transnational. Also the *number of citations* leveled more evenly between the 10 most cited articles in the first two searches (glob* and internat*) while in the third search (transnat*) only the first few articles had gained citations. Therefore the number of average citations per published article was almost the same in all the searches. However, in the third search (transnat*) this was only due to the citations the first articles had gained[19].

In a sum, according to the results the first articles concerning innovation communities and globalization were published in 1994. However, interest towards the study field has grown within the 20th century and especially during the last few years. Both the number of published items and the number of citations have multiplied within the twenty-year time-span and the growth rate has accelerated especially during the recent years[20]. Nevertheless *global innovation community* as a concept is still a rather marginal theme.

After studying the annual publications and citations per year I chose ten most relevant articles[21] to understand the globalization of innovation communities better. Based on a chart[22] mapping features of how innovation communities and their globalization were experienced in the articles tentative results were deduced. According to these there is no common and clear definition for *innovation community*. The concept was directly defined only in four articles, while in others it had to be deduced from the context and empirical data. However, it may be said that innovation communities work as sources of knowledge, which may be seen as their key quality.

[19] It is worth noticing, that some of the articles came up in more than one search and were represented in two or more searches. However, it would have been impossible to conduct the search otherwise using the Web of Science. Another important point is that using only the Web of Science in sample-forming may not provide all the relevant articles of the research topic. However, Web of Science offers a good tool to choose at least some of the most important articles.

[20] More searches on the Web of Science showed that there has been a growing interest towards the study field of innovation (not only the globalization of innovation communities). There is a steady growing curve in the field of innovation study which is accelerating the further we get with the 20th century. This puts the numbers of the searches described here into proportion: the growth rate within the globalization of innovation communities is parallel to the growth of other sectors in innovation study. See appendix 1 for more information about the additional searches conducted.

[21] See appendix 2, table 1. for article information of the 10 chosen articles with authors, article information, search words, total citations and average citations per year starting from the biggest.

[22] See appendix 2, table 2 for Summary of key elements of the Innovation Communities in articles.

There are also differences in how innovation communities provide knowledge and in which context. The exchange of knowledge and information varies between the community types and there are different incentives for the exchange. In most cases knowledge is exchanged to create economic growth or to enhance competitiveness and even though the communities may have various exact goals, it is evident that innovation communities are virtually always using their knowledge recourses to promote economic success. However, there were for example epistemic and policy related communities, in which learning and raising public awareness were the key goals. In addition new technologies have made interaction possible and global knowledge has been recognized to be useful for many innovative processes and in innovation communities global transfer of tacit knowledge is possible.

Analyzing the data also shows that the communities may be divided on spatial and temporal terms. The spatial division can be made between communities that are located in one place and aim to adjust to global interaction, and those that are dispersed to different parts of the world and take advantage from their diverse and extended knowledge base. The temporal division can be made between the communities that are long-standing or even virtually permanent and those that are fast-evolving or even temporary. Globalization is a generic context for the communities, and in most cases the role of community is either to ease the adaptation or to enhance the sought of opportunities in the new context (not related to the integration of foreign talent). This may be seen in how innovation communities reach towards building global connections and linking them to the local level. In this point of view they may be related in *linking foreign talent* to the innovative activities (but still not straight forwardly integrating).

4.3 Screening Innovation Communities in Finland

The recognition of real-life innovation communities in Finland is important because only with recognition we are able to understand how these communities work and, furthermore, create a picture of how the learning processes within them are structured and what kind of learning processes they actually provide to the economy in general and to the regional economy in particular. Studying these processes provides important insights on how foreign talent is integrated into innovation activities, which may be of value for the future development of a country´s economy.

The screening of global innovation communities revealed many different kinds of communities, which have some similarities but also many differences. First, there are differences in the *spatial dimension* of the spotted communities: some are more global than others and others are more embedded in local activities. Second, some of the communities are based on more *temporal activities* than others: some are established around a specific project after which the community may and is even expected to vanish while others are more long-lasting. Third, there are differences in what kind of *operational environment* the community integrates people to: some communities emphasize more *innovation and innovative activities* while others are based more on *innovation-related activities*.

Based on a small screening of innovation communities four approaches to innovation communities could be categorized: (1) *Business Networks*, (2) *Immigration Communities*, (3) *Expat Networks* and (4) *Innovation Platforms* (Table 1). It seems that these different approaches on innovation communities attribute to the combination and creation of knowledge and thus to the integration of human capital. Especially *innovation platforms* seem interesting. However, they are rather *policy platforms* supporting the development of innovation communities than pure innovation platforms. Innovation platforms support innovation activities and tap foreign-born people into innovation processes. On the basis of a small screening any further assumptions of the functionality of innovation platforms could not be made. Therefore it was important to study how innovation platforms had been discussed in recent literature.

Table 1: *Four Approaches to Global Innovation Communities*

Business Networks	*Business Networks* are business based communities, which aim at creating monetary benefits for themselves by using innovation communities as a source of new ideas. Innovation communities in these Business Networks may also consist of the R&D work practiced in these organizations, which want to share information in order to create new operational models to be used in the creation of new products or business models. Open innovation and involving models are becoming popular in these communities.
Immigration Communities	*Immigration Communities* tie together foreign-born people on the basis of their origin, their migration destination or some other factors that relate the members together. There are different activities tying the members together: communities may be more interest driven or more based on spatial dimensions. Common is that they help integrating international people into innovation activities by providing them support networks. These communities may also be considered as innovation communities for they connect foreign-born people and help them to integrate into innovation activities by taking into consideration the social and cultural aspects.

Expats Networks	*Expats Networks* can be related to the Immigration Communities for they work to create understanding for the foreign-born people about the destination they are considering moving to. There are for instance websites, which provide help to people who consider moving to a country. In these websites people can share their experiences and read blogs, in which people provide genuine experiences compared to travel brochures. This helps in creating an authentic picture of a country. There are also networks, which target at connecting foreigners into social and professional networks.
Innovation Platforms	*Innovation Platforms* are strongly connected to innovation and they work tightly on the regional level. The level of internationalization varies from a platform to platform. There are regional innovation platforms, which connect business expertise, research and students from different fields together. Some of the platforms operating are project-based; some of the projects operate for a longer period of time but some are only generated for a short period. There are also platforms, which work on constantly changing projects.

4.4 Innovation Platforms

Innovation platforms offer a space for innovation communities and thus facilitate their emergence. This is supported by the work of Raunio and Kautonen (2014) who suggest that *platform-based* models and *community-approaches* may offer more efficient and self-sustaining linkages between regional innovation activities that are located in different countries than the more traditional policy models. Regional level has been acknowledged important for the socio-economic integration of newcomers. Additionally in order to globalize innovation activities to other countries through franchising of activities, community-building practices need to reach a genuine transnational mode. (ibid 2014.)

Asheim, Boschma and Cooke (2011) concentrate on creating regional innovation policy models based on the idea of constructing regional advantage by bringing together the concepts of related variety, knowledge bases and policy platforms. Related variety links knowledge spillovers to economic renewal and regional growth. Long-term development of regions is hereby connected to their ability to diversify while at the same time still constantly building their current knowledge base and improving competences. Related variety consists of intangible features and is thus difficult to copy to a new environment. However, because of the growing complexity in the operational environment, companies have experienced an increasing need to acquire new knowledge to supplement their internal knowledge bases. This is done either by involving new

human capital into their innovation processes or by collaborating with external firms, research institutes or universities. (ibid 2011.)

The fuel of regional innovation platforms may be seen in the power of diversity. The concept of regional innovation platform is strongly bound to the institutional set-up of a region which may be either formal or informal in nature. (Uotila, Harmaakorpi & Hermans 2012.) Thus a region increasingly becomes a home base of innovation and learning, and it is also a competitive unit against the pressures of globalization (Raunio & Nordling 2012).

Uotila et al. suggest that regional innovation platforms must be separately defined each time but they introduce three defining elements for the concept. (1) Regional innovation platforms aim to solve the problem of proximity and distance in a specific way that is connected to related variety. The main advantage here is higher capacity to absorb innovation from neighboring sectors. (2) Regional innovation platforms are based on the identification of the existing regional resource basis rather than on the identification of existing clusters. Hereby the practical organizations in a regional innovation system based on *platforms* may be different from *cluster*-based organizations. Typical for regional innovation platforms is that they emerge from unconventional combinations of knowledge, competencies and other resources that may exploit (regional) related variety. (3) Regional innovation platforms are fundamentally future-oriented. The platforms are established by identifying future socio-economic circumstances and thus creating competitive advantage by this identification and combination of different resources. These competitive advantages are based on the dynamic capabilities of the diversified actors working for the platform. (ibid 2012.)

Above it has been described how innovation platforms have offered a tool to combine different regional knowledge resources and as Raunio and Kautonen (2014) suggest innovation platforms may also provide a greater emphasis on the students´ role in innovation processes due to students´ role in universities which are connected to innovation platforms and thus nowadays to a greater extend to regional innovation activities. Hereby innovation platforms may contribute to the competence building of the students, too (ibid 2014). Moreover Raunio and Kautonen address a question that is also relevant for this study: How is it possible to increase the positive impacts of global innovation processes in a certain geographical area, in one's own national or regional economy? As a answer to this they introduce that innovation platforms may offer such a tool by placing platforms into different locations abroad. Innovation platforms could offer linkages between different locations in various countries and hereby contribute to global

community-building practices (ibid 2014). In the best scenario linking different regions together the positive impacts could be enhanced. However, even though almost each region has innovation potential, the nature of this potential differs greatly between regions due to different cognitive and institutional structures that the region has been built on (Asheim et al. 2011). Moreover as Karppi (2012) outlines platforms must always be designed for people and to match with their individual social needs. Therefore linking different regional platforms together may not be so straightforward when considering the diversified characteristics of the ecosystems.

Nevertheless after coming to the outcome that innovation platforms are best in tapping foreign-born people into innovation activities and regional knowledge economy, learning about the local practices became important. Thus I will next concern local innovation platform Demola, Tampere, Finland and its possibilities in diversifying local economy by integrating foreign-born students into local innovation activities. The case study will enhance the general understanding on how and on what level local innovation platforms may link international students into local innovation activities.

5 LOCAL DEVELOPER DEMOLA

In this part of the study I observe whether Demola helps students integrate into Finnish innovation activities and communities. This part of the study enhances understanding on whether there are differences in the integration processes between international and Finnish students. The differences (and similarities) of the three student groups are illustrated by presenting multiple figures that show how different groups have responded to the survey. This will help in formulating a picture whether there are differences in the integration process between the student groups. The research questions addressed here are:

- *How students integrate into innovation processes through innovation and development platform Demola?*
    - *Are there differences in the integration processes between the international and Finnish students? If yes, why?*

5.1 Demola

Demola is a Finnish regional innovation and development platform that involves students from different fields into real-life projects that connect them with business field and creates networks to companies. Demola is part of *New Factory*, an innovation hub operating in Tampere. (Raunio & Kautonen 2014.) New Factory may be characterized as a cluster of various activities and communities (Karppi 2014). Altogether New Factory consists of four parts, or engine rooms (i.e. platform components), which are *Demola*, *Protomo*, *Suuntaamo* and *Accelerator*. Each of them has their own functions but at the same time they all work towards the same goal of creating new business through open innovation processes. (Raunio & Kautonen 2014.) Thus all four components are built to meet with the needs of students, self-employed entrepreneurs, researchers and developers (Karppi 2014).

Demola is used as a tool to adjust local economy to global structural transformation. As the students gain valuable experience, and may built networks to local industry and government actors, also the city of Tampere is benefiting from the model. For the City of Tampere and the city region Demola may be seen as a tool for dynamic industrial renewal. (Karppi 2012.) Demola is an environment to generate prototypes and demonstrations from ideas coming typically from private firms, which are developed in projects by multidisciplinary and multinational student

groups. Demola has so far been the most visible part of New Factory. Behind New Factory there are several key actors of the regional innovation policy including Hermia Ltd. and the three universities located in Tampere. (Raunio & Kautonen 2014.)

Hermia Ltd. is focused in coordination of industry and research networks, high-tech product development services and efficient innovation platforms and processes. Hermia Group's products include different kinds of services for innovation, training, coaching, start-ups, product development, and networking. (Hermia 2013.) Essential characteristics of New Factory are openness and many community-like features that make it stand out from the traditional innovation platforms. Demola has also extended it activities to multiple cities after the good experiences in Tampere, where Demola was launched in 2008. Demola has become a European wide network since it has grown with five new Demola centers in Lithuania, Hungary, Sweden (two locations) and another unit in Finland. (Demola 2013.)

A typical collaboration scenario in Demola starts when a firm having a concept or an idea that is subject to high levels of uncertainty decides to outsource the development process to Demola to come up with a prototype or a demonstration through further development and testing. The project contract is signed by the firm and the team after which the concept is evaluated and formalized into a project design by Demola. The concept development may last from three to eight months and the process is supported by Demola and the firm. The projects take about ten to fifteen hours of work per week from the students. The students are able to get credit points from participating in the project and in addition they own the results of their work. If the project partner is satisfied with the project outcome it is possible that the license will be bought from the students, which means that they get money from the participation, too. (Raunio, Kautonen & Saarinen 2013, 26.)

The benefits of Demola are not limited to a single firm; since the student team has also a chance to utilize the created immaterial assets by setting up a start-up company in a case where a firm does not acquire a license for the IPR (intellectual property rights[23]) students may also be recognized for their talent, leading to employment. All IPR generated during the project belong to the student team. In the end of the project, the partner firm can acquire a license to the results and reward the students for their work according to the earlier agreed performance criteria. The method has been experienced notably effective. This is thanks to the well-defined IPR

[23] Intellectual property rights are the rights given to people over the creations of their minds. They usually give the creator an exclusive right over the usage of the creation for a certain period of time (World Trade Organization 2014).

framework, the focus on the concepts pre-selected by firms and the diverse set of skills and ideas of the students working on it. (Raunio, Kautonen & Saarinen 2013, 26.)

5.2 Data and Respondents

This example takes a look at the integration processes in the innovation platform Demola. Based on the settled research questions the study focuses on how Demola involves students into innovation activities and what kind of incentives it provides for the student participation. There are both foreign-born and Finnish students involved in the projects and thus it may be discussed whether there are differences in the integration processes between the international and the native students. It should be noticed that share of foreign students in Demola projects is rather high: 44% of the respondents are international students. So it is a relevant platform for this study.

The empirical data is based on two sets of surveys[24] with combined number of 107 respondents. The questionnaire concerned either 36 or 34 questions depending when the respondent was attending a Demola project. There were two extra questions for the students participating during the semester. These questions concerned summer jobs. All the figures shown in this study are rounded to the nearest whole number and no numbers smaller than five are shown in the figures. This is to make the illustration as explicit as possible.

The questionnaire included a question mapping the respondents´ student status and according to this the students were categorized to:

(1) international degree students (23%)

(2) exchange students and (16%)

(3) Finnish degree students (60%).

To create a picture of the respondents they were also categorized into groups based on their field of study (Fig. 6). The respondents were asked about their field of study in an open question and then these answers were categorized into three main groups: (1) administration/management, (2) technology and (3) social sciences/humanities. Of all the respondents over sixty percent (63%)

[24] See appendix 3 for the questionnaire.

studied in the field of technology. About one fourth (24%) were in social sciences or humanities and the rest (13%) studied administration or management.

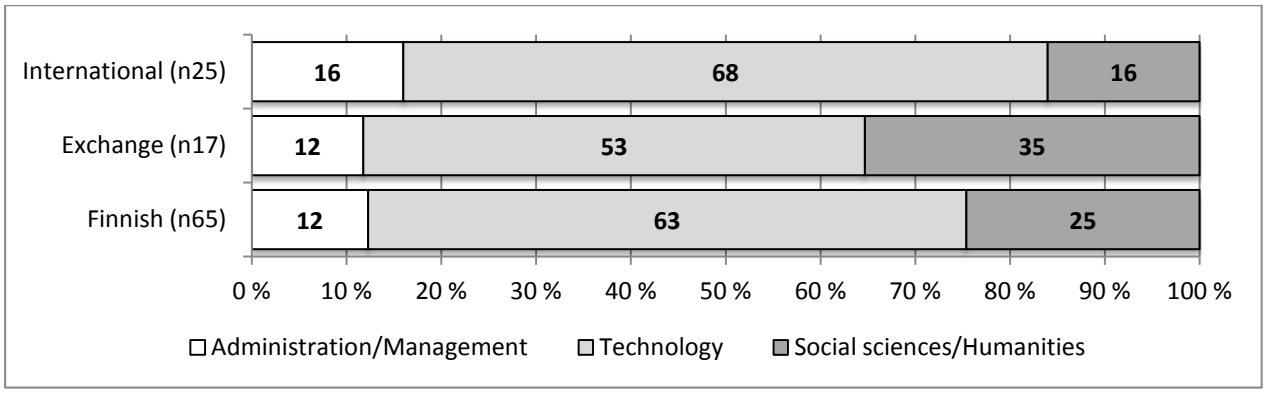

Figure 6. *Fields of study (N 107)*

The background of the respondents was also mapped by asking if any of them were entrepreneurs. According to the responds one fifth (22%) of the Finnish degree students, four percent of the international degree students and six percent of the exchange students were entrepreneurs: All together this means that fifteen percent of all the respondents were entrepreneurs (see appendix 5, figure 1).

Majority of the students participated in a Demola project for the first time[25] (Fig. 7). Of the international degree students forty percent had been involved in an earlier Demola project. The percentage was almost the same among the Finnish degree students (37%). One fifth (18%) of the exchange students had also been involved in a Demola project before this survey took place.

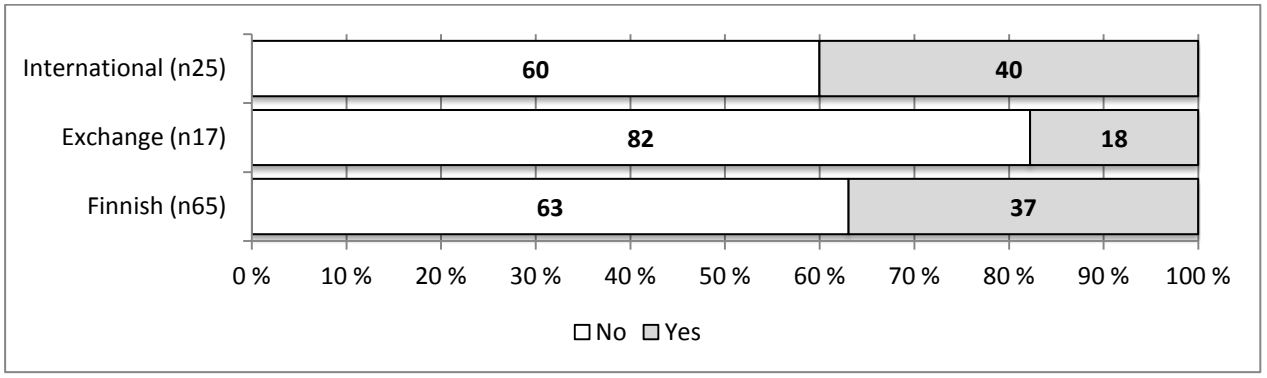

Figure 7. *Have you participated in a Demola project before? (N 107)*

[25] The respondents were asked *what the number of their Demola projects so far had been.* Whoever had answered zero or one were taken as first-timers. The students who answered two or more were taken to have participated in a Demola project earlier. There was also one respondent who had replied with *4105*, this answer was taken as the student had been part of a project earlier. In the chart only *yes* and *no* replies are presented.

There were also differences where the respondents had learned about the possibility to take part in a Demola project (Table 2). Half (53%) of the respondents had found Demola from a university´s info. Alongside with this also personal networks were strong on spreading the information (29%) whereas other information channels were not so effective in promoting Demola among students. For a vast majority of the international and exchange students university was the strongest link to Demola. For the Finnish students also personal networks were strong.

Table 2. *From where was Demola found (N 107)*

	International	Exchange	Finnish	**TOTAL**
Demola´s road show	4 %	6 %	6 %	**6 %**
Demola´s web site	4 %	0 %	3 %	**3 %**
Social media	4 %	0 %	3 %	**3 %**
University´s info	56 %	82 %	45 %	**53 %**
Personal networks	28 %	6 %	35 %	**29 %**
Newspapers	0 %	0 %	2 %	**1 %**
Unspecified source	4 %	6 %	6 %	**6 %**

Overall the experiences of participating in a Demola project were considered good. Almost all the respondents replied that their reasons to attend a Demola project were mainly fulfilled and majority felt that they were personally satisfied with the project´s results (see appendix 5, figures 2–3).

5.3 Reasons to Attend Demola in the three Students Groups

The respondents had different reasons to attend a Demola project. These reasons were divided into three categories: (1) professional reasons, (2) networking and (3) practical reasons[26]. Developing one in a professional way and widening professional and social networks enhances one´s position in the labor market. Both professional reasons and networking focus on long-term benefits whereas the practical reasons, in turn, focus on fulfilling one´s instant needs. The importance of each of these three dimensions were measured by asking the students a series of questions on *how important are/have the reason been for you to attend Demola.* The scale was from 1 to 5 (5 being very important and 1 not at all important).

Professional reasons concerned enhancing one´s professional and practical competencies, acquiring new skills and getting work experience (i.e. building human capital), which all happens in a social context. Professional reasons of attendance was measured with four questions: (1) *Importance of acquiring new skills* (Fig. 8), (2) *Importance of getting work experience* (Fig. 9), (3) *Importance of enhancing formal professional competencies* and (4) *Importance of increasing practical competencies* (figures shown in appendix 5, figures 4–5).

The networking category includes both professional and social networking. Thus is concerns one´s desires to establish connections to business field and to form friendships that both assist in building up a social network (i.e. constructing social capital). Reasons of attendance related to networking were measured with two questions: (1) *Importance of getting contacts to business field or companies* (Fig. 10) and (2) *Importance of getting to know people and making new friends* (Fig. 11).

The practical reasons include studies-related reasons and money. The practical reasons of attendance were measured with three questions (1) *Importance of getting credit points,* (2) *Importance of money* and (3) *Importance of enhancing the quality of thesis* (figures shown in appendix 5, figures 6–8).

[26] This chapter concerning the reasons behind attending a Demola project does not take into consideration the reason of *location* which was mapped in the original questionnaire: it was not appropriate to focus on how the location was experienced. Neither the deviation between the student groups brought in any significant information. In addition within the same questions there was one respondent who stated *"I do not know"* in every section of the question and due to the consistent replies this was ruled out from the answers.

Of the three student groups the *international degree students* found professionally related reasons most important. It was in their desires to improve themselves professionally as almost a hundred percent felt that to acquire new skills was either important or very important to them (Fig. 8) and over ninety percent thought that to get work experience was important or very important (Fig. 9). Moreover 84 percent found enhancing formal professional competences important or very important and 88 percent found increasing practical competencies important or very important (see appendix 5, figures 4–5).

The *exchange students* did not find professional reasons quite as important as the international degree students. Although the dimension was experienced overall important, many of the exchange students felt the professional reasons to be rather somewhat important than important or very important. However, almost ninety percent found acquiring new skills important or very important (Fig. 8) alongside with over eighty percent who thought that getting work experience was important or very important (Fig. 9). 75 percent stated that enhancing formal professional competencies was important or very important, 77 percent that increasing practical competencies was important or very important (see appendix 5, figures 4–5).

When comparing the three student groups the *Finnish degree students* found professional reasons somewhat as important as the exchange students. Ninety percent found acquiring new skills important or very important (Fig. 8), 84 percent getting work experience important or very important (Fig. 9), 71 percent found enhancing formal professional competencies important or very important and 82 percent increasing practical competencies important or very important (see appendix 5, figures 4–5).

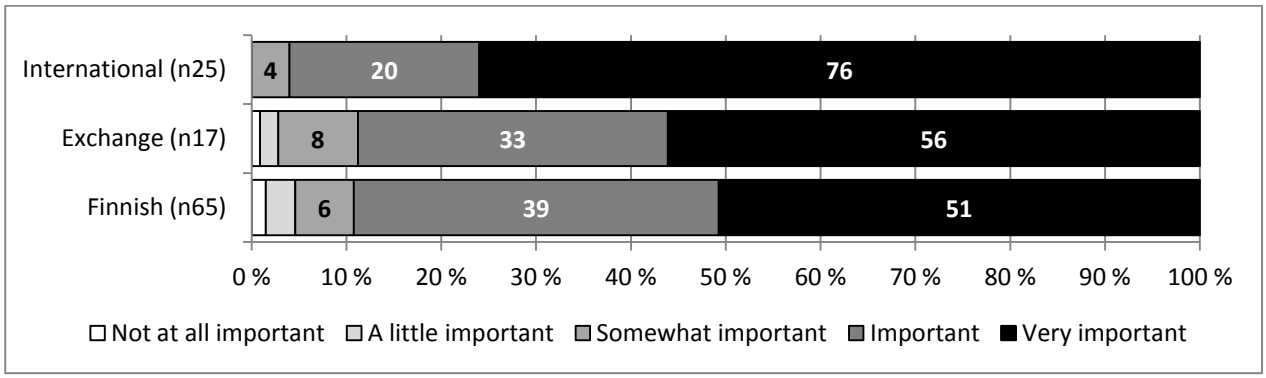

Figure 8. *Reasons to attend Demola: Importance of acquiring new skills (N 107)*

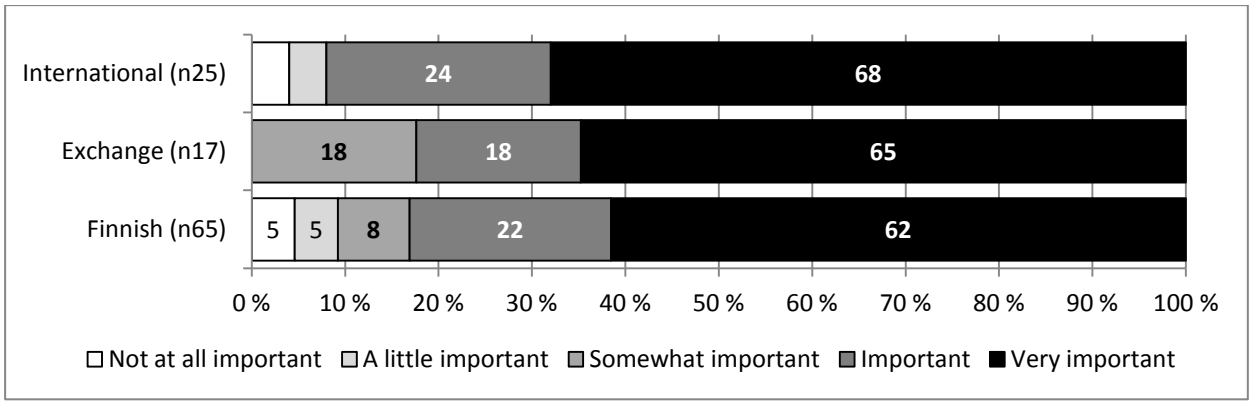

Figure 9. *Reasons to attend Demola: Importance of getting work experience (N 107)*

The international degree students found networking the most important both professionally and socially when the three student groups are compared with each other: over sixty percent of the international degree students found getting contacts to business field or companies important or very important (Fig. 10) and over seventy found getting to know people and making new friends important or very important (Fig. 11). The Finnish degree students thought in line with them, for 61 percent of them found professional contacts important or very important and 66 percent thought that social networks were important or very important. Only 35 percent of the exchange students found establishing professional contacts important or very important and 53 percent found getting to know people and making new friends important or very important.

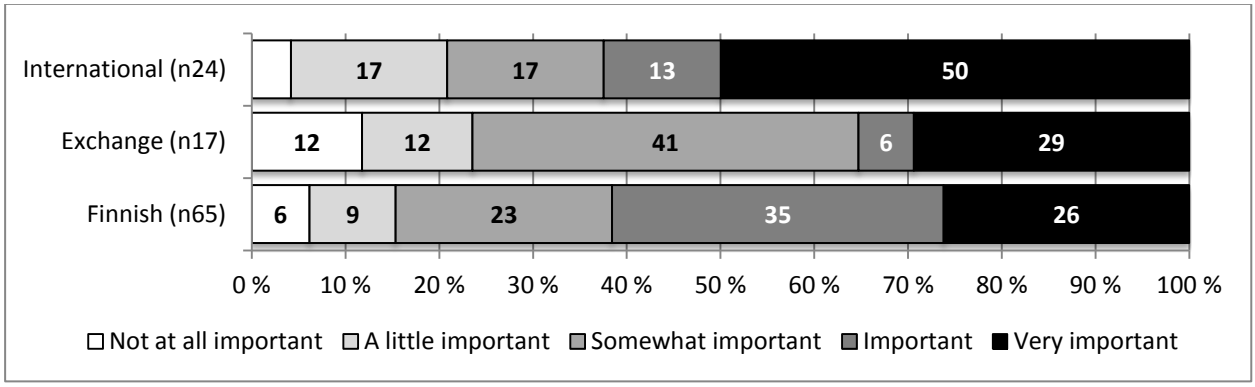

Figure 10. *Reasons to attend Demola: Importance of getting contacts to business field or companies (N 106)*

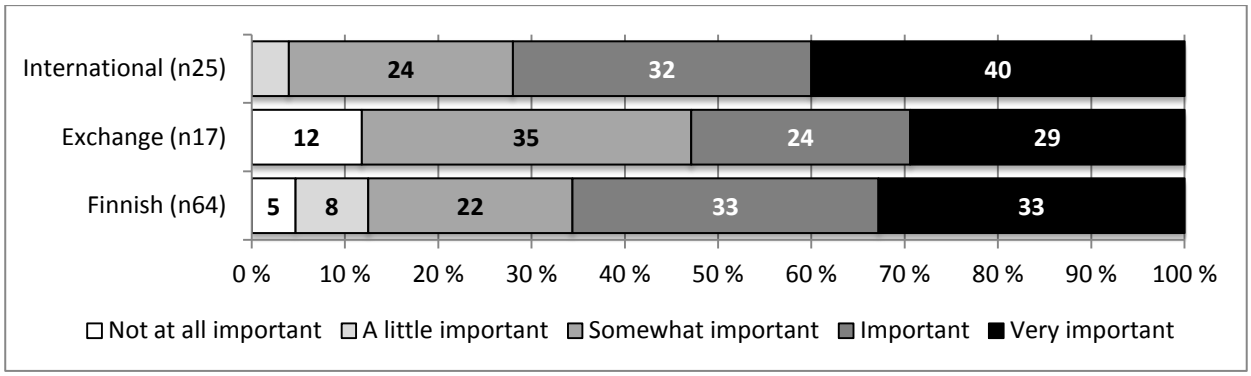

Figure11. *Reasons to attend Demola: Importance of getting to know people and making new friends (N 106)*

Thus it seems that the international and Finnish degree students were more eager in establishing both professional and social networks than the exchange students. This may be explained by that the exchange students are not so keen on tapping to the local activities and networks because their stay will not be long. The international and Finnish degree students aim at linking into the local business field and forming friendships with like-minded people with a more long-term plan in mind.

The numbers suggest that the international degree students are looking more human and social capital related benefits from the participation. They seem to be the group that the most wants and needs to improve their opportunities to get employed. That the Finnish degree students were not as eager to enhance themselves professionally as the international degree students might be explained by factors such as that the Finnish degree students had been provided with similar opportunities to get familiar with professional life and their employment is more secured than the international students´. Thus the reasons of their attendance lay elsewhere.

The fact that the numbers are somewhat more discreet among the exchange students than the international degree students when considering professional reasons of attending Demola, may be deducted from that the exchange students did not choose the exchange program to begin with to improve themselves professionally. Exchange students might have had other agendas such as getting new experiences and traveling in their minds whereas the international degree students might have applied to the program for more professional and academic reason. Nonetheless getting work experience was almost as import for the exchange students as it was for the international degree students, hence professional and practical competencies or new skills were not so high up in the reasons to attend Demola when the two groups are compared.

The practical reasons included studies-related reasons and money. Studies-related reasons were regarded as least important reasons to attend Demola in all three student groups. Although one fifth (28%) of the international degree students found getting credit points to be important or very important there were as many international degree students who though it was not important at all (see appendix 5, figures 6). The importance of getting credit points was important or very important to thirty percent of the exchange and to 35 percent of the Finnish degree students. Money was equally important for the international and Finnish degree students for 36 percent of both the groups found it important or very important as for only 12 percent of the exchange students thought the same (see appendix 5, figure 7). The importance of enhancing the quality of thesis was experienced not important in each of the student groups (see appendix 5, figure 8).

From the practical reasons the importance of money may be the most interesting reason to consider when looking at the participants reasons to attend a Demola project. Even though improved skills and accomplished new networks were found significantly more important reasons of attendance it is interesting to compare the differences there are among the degree (international and Finnish) students and exchange students. It seems that Demola alongside with offering a medium for the students to improve their skills and build new networks is also a more practical tool for the degree students (e. g. to earn money) than it is for the exchange students. This may be explained by that the exchange students might have saved money beforehand to cover their exchange period as for the degree students had to be employed in a way or another. Thus if they would not had a position in a Demola project they would have had to apply employment elsewhere.

5.4 Learning in Innovation Processes

The questionnaire also concerned the aspect of *learning* in the innovation processes offered by the Demola project. The students were asked if they had learned (1) *anything specific from the other team members (if yes, what)* and (2) *which was the most important thing learned while working in the project*. Over half (54%) of all of the students told, that they had learned something specific from the other team members[27]. They were then asked to specify this learning in an open question. The answers resulted *specific skills*, which were categorized into three types

[27] Of the international degree students 76% and 50% of the Finnish students told that had they learned something while only 36% of the exchange students experienced that they had learned something specific.

of skills based on their similarity. The categories identified were (1) management skills, (2) technical skills) and (3) interaction skills[28]. In the managements skills category the students specified that they had learned time management and the importance of planning while in the technical skills category students told they had acquired new competences for example in game design and programming. The interaction skills learned involved team work, communication and understanding cultural differences (Fig. 12).

"I learned presentation skills from our graphic designer, programming skills from our programmer." – International Degree Student in a Demola project in 2012

"I need to work harder, I need to learn how I can reach the knowledge and share my knowledge... Other team members are my best luck for my professional working life." – Exchange Student in a Demola project in 2012

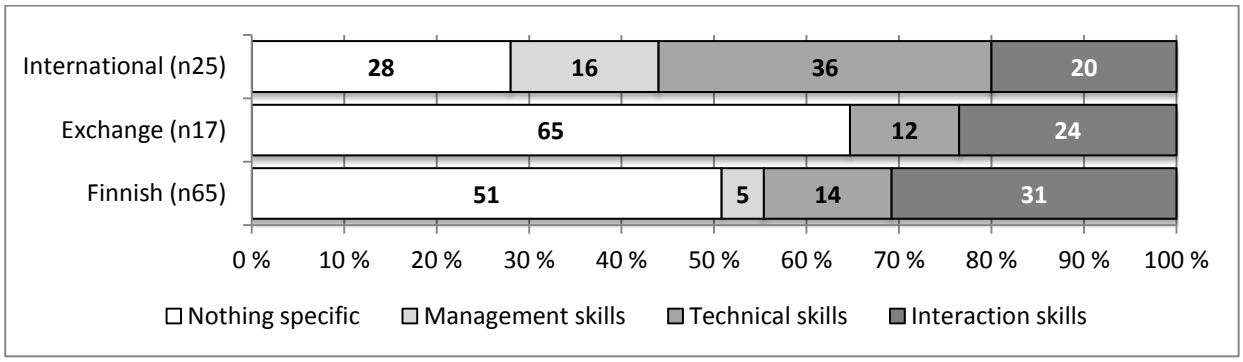

Figure 12. *Specific skills, if any, learned from other team members (N 107)*

There were differences between all the three students groups. The international degree students were the biggest group to experience that they had acquired specific skills from the other team members (72% agreed to this) whereas of the exchange students only one third (36%) agreed. The Finnish degree students were placed between the international degree students and the exchange students in their experiences with half (49%) of them specifying skills learned from others. This may imply that the incentives and motives of the international degree students were set more on learning from others and even on learning certain skills from either the fields of management, technology or interaction than the other two student groups. That the exchange students did not recognize learning from other members of the team may imply that they did not participate to learn but to get the experience.

[28] However, it is to be noted that some answers included elements from more than one category, yet, these answers are discussed only in one category based on what was the strongest point made by the respondent.

The respondents also specified what had been the most important things they had learned from the experience of working in the Demola project (Fig. 13). This was an open question from which the answers could be categorized into four groups: (1) management skills, (2) technical skills), (3) interaction skills and (4) practical skills[29]. The three first mentioned are defined similarly as in the question whether there were any *specific skills* the respondents had *learned from the other team members* (see above). Practical skills *are skills that people usually learn by doing and by experience*, and therefore it is understandable that the category did not come up in the question mapping the specific skills learned from other team members. As practical skills are obtained from real-life experiences they concern such know-how as getting things signed, attending conferences and implementing ideas into practice.

"I learned a lot of new techniques and learned a lot about working in a creative environment outside of university. It was a fantastic experience. – Exchange Student in a Demola project in 2012

"-- Demola offers a great chance to see how the work is really done in work groups and how the client fits in the whole picture." – Finnish Degree Student in a Demola project in 2012

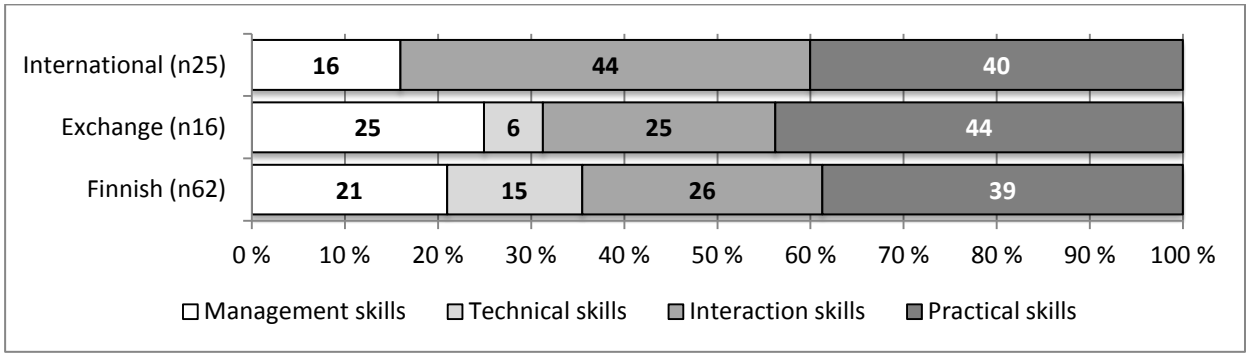

Figure 13. *The most important things learned in Demola (N 103)*

Of the international degree students 44 percent experienced that that the most important thing they had learned while working in the project was interaction. 40 percent of them underlined practical skills were mentioned while 16 percent acknowledged picking up management skills the best from the process. Noteworthy is that none of the international degree students identified learning technical skills from working in the project. This might be interpreted simply by seeing that other skills were valued more for it shown in the specific skills learned from others that international degree students had also learned technical skills during the project. Thus probably

[29] Again it is to be noted that some answers included elements from more than one category, yet, these answers are discussed only in one category based on what was the strongest point made by the respondent.

these skills were merely learned from others. Of the exchange students over forty percent stated that practical skills were the most important skills learned from the work in the project. One fourth (25%) of the exchange students though the most important thing they had learned were interaction skills and another one fourth (25%) named management skills. Only six percent felt that technical skills were the most important thing learned. Of the Finnish students almost forty percent experienced that practical skills were the most important skills they learned while working in the project. One fourth (26%) thought that interaction skills were the most important and one fifth (21%) mentioned management skills while 15 percent found technical skills to be the most significant ability gained.

Even though technical skills were not identified as the most important thing learned from the Demola project by too many students, it does not necessary mean that these skills were not improved during the project. For example they were mentioned by every student group as the specific skills learned from other team members. That they did not come up as the most important thing learned may merely addresses that other experiences were valued even more.

"I learned many things but the most important thing I learned, is to be realistic when you are working on a project." – Exchange Student in a Demola project in 2012

"Time management, interpersonal skills, and team work experiences are the best thing that I learned. In addition, I also learned more about presentation skills, how to motivate other members to keep working with high efficient[cy]." – International Degree Student in a Demola project in 2012

That the international students alleviated that they learned skills related to interaction the most supports their reasons to attend the project. International degree students showed the most interest towards building human and social capital during the project, and the learning process shows that these were just the skills that were identified the most. Hereupon when considering the integration of foreign talent this is significant. Interaction in a new environment always requires adjusting and the lack of this adjustment has been the problem to involve foreign-born people to the Finnish economy. Therefore that the international degree students feel they are adjusting to the new environment is significant.

Overall the results show that the things learned from other team members and the skills obtained from the project are somewhat different. The Demola experience had also enriched many students with a range of practical skills that are best obtained from working in a real-life

environment. These skills may be important in later work life. The exchange of knowledge (skills learned from other team members) were not so easily identified as the skills learned from the Demola experience (the most important things learned in Demola). The reasons for this may that identifying what was directly learned from other team members and what was learned during the project may be difficult to separate from each other. Moreover the educational background of the students may affect the skills learned. Nevertheless, the results suggest that students in every student group felt that they had learned both specific skills from other team members and skills during the project as a result of interactive learning.

5.5 Supporting Self-Image as Innovative Entrepreneurs

The survey also concerned questions about the students´ professional self-image. I consider professional self-image pertaining to the question of how one is experiencing oneself as an employee and as a team member, and in what level the Demola project might have improved one´s competences, changed attitudes towards work life or one´s own future and, hereby, changed one´s *professional self-image*. Main focus is whether Demola integrates foreign human capital to innovation activities as firmly as it integrates local human capital.

The students referred to these aspects also in some of the open questions that concerned the students´ main contribution to the project team and questions that concerned learning from other team members and learning during the Demola project[30]. Thus some quotes from answers given to these questions will be shown here to support the presented figures.

A significant number of all respondents stated that they had learned a lot about themselves both as employees and as team members during the project (Fig. 14) and that they had also learned a lot about team communication which they felt would be beneficial in their future work (Fig. 15). None of the respondents (including all student groups) disagreed to the latter statement. Both statements give similar results in all the student groups.

[30] The questions applied here were: (1) What do you think was the main contribution you gave yourself to the team? (2) What is the most important thing you learned while working at Demola? (3) Did you learn anything specific from the other team members? If yes, what?

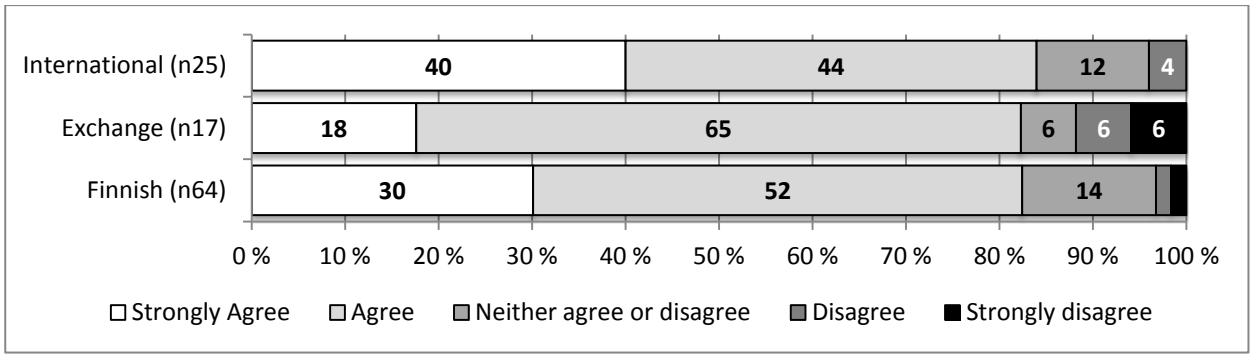

Figure 14. *Due to the Demola experience I learned a lot about myself as an employee and as a team member (N 106)*

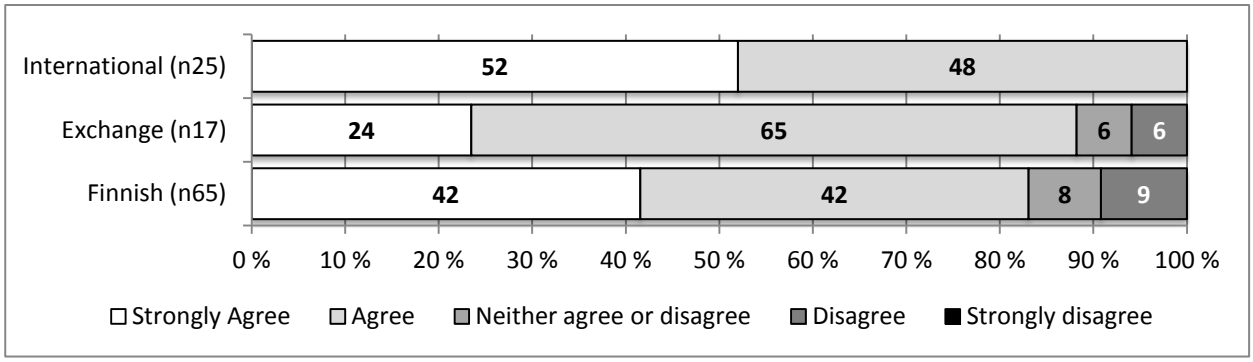

Figure 15. *During the project I learned a lot about team communication which will be beneficial for my future work (N 107)*

"I need to work harder, I need to learn how I can reach the knowledge and share my knowledge... Other team members are my best luck for my professional working life..." – Exchange student in a Demola project in 2012

"Communication is [the] key: people should be able to tell each other how they honestly feel about each others' working habits, and learn to communicate these things in a diplomatic, constructive manner." – Finnish Degree Student in a Demola project in 2012

Moreover the Demola experience boosted the students´ self-image as professionals (Fig. 16). Of the international degree students over eighty percent (84%) felt that their professional image had increased while working in a Demola project. The thoughts of the exchanges students and the Finnish degree students were roughly in line in with this.

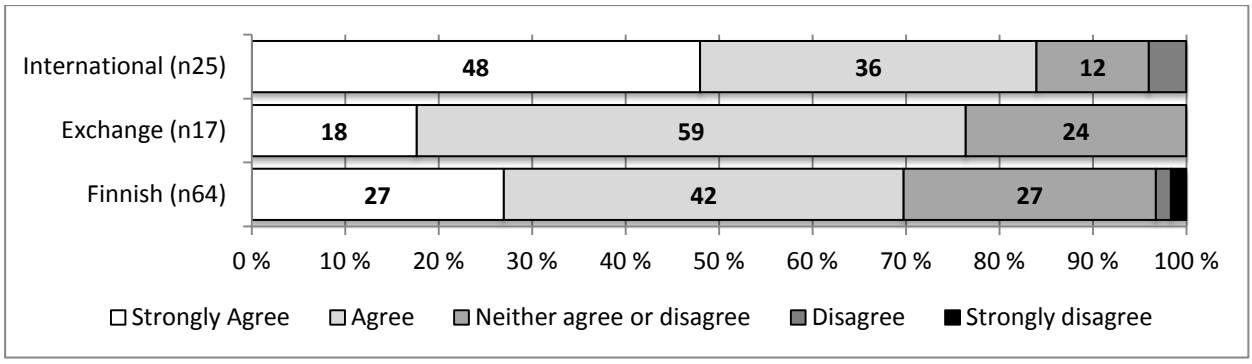

Figure 16. *My Demola experience increased my self-image as a professional (N 106)*

"- - I guess the most important thing was the confidence I gained. That I can really go out and work as a professional." – Exchange Student in a Demola project in 2012

"I learned how to work in a team and also gained a lot self confidence." – Finnish Degree Student in a Demola project in 2012

Students also had decided to acquire new professional competences due to their experiences in Demola (Fig. 17). Eighty percent of the international degree students said that they would improve their professional skills (agree or strongly agree) while almost sixty percent of the exchange students felt the same. From the Finnish degree students almost seventy percent wanted to acquire new skills.

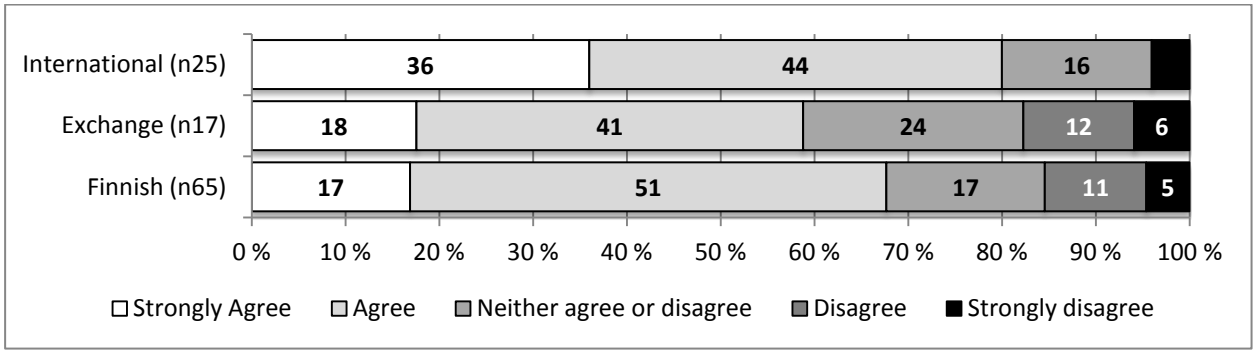

Figure 17. *Due to the experiences in Demola I decided to acquire new skills to my professional competence (N 107)*

The expectations of attending a Demola project seem to have been well in line with the experiences gained from the project. Majority of the respondents said that the Demola experience corresponded well with their goals for working experience. Eighty percent of the international degree students agreed or strongly agreed to this, 71 percent of the exchange students and 75 percent of the Finnish degree students (see appendix 5, figure 9). Moreover, over

half (55%) of the international degree students felt that the Demola experience changed their attitude towards entrepreneurship more positive (Fig. 18). Also associations among the exchange students were positive for as much as 59 percent said that their attitude became more positive. Among the Finnish degree students the percentage was 48. Even though the number of entrepreneurs was not high among the respondents the results show that entrepreneurship started to look a good choice: one third of the international degree students (38% either agreed or strongly agreed) and almost sixty percent (59%) of the exchange students related to this while one third (32%) of the Finnish degree students felt the same while (Fig. 19).

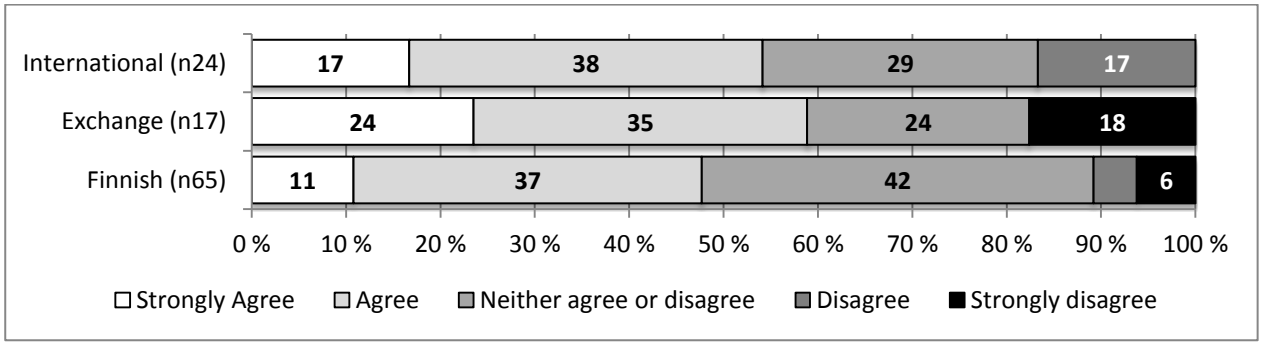

Figure 18. *Demola experience changed my attitude to entrepreneurship more positive (N 106)*

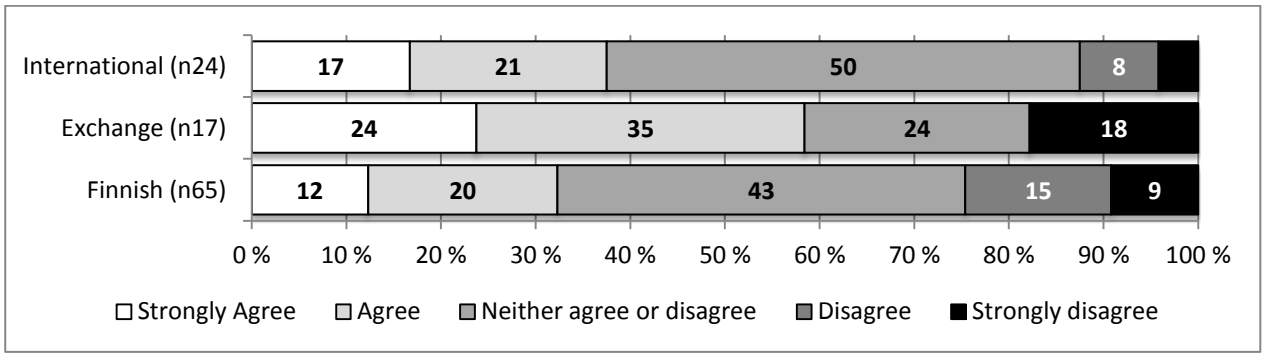

Figure 19. *Entrepreneurship started to look like a good choice to me (N 106)*

"[the most important thing I learned while working at Demola was] That I want to become an entrepreneur." – Finnish Degree Student in a Demola project in 2012

The students were also asked whether the Demola experience changed their image of work life[31] (Fig. 20). Over half (54%) of *all the respondents* stated that their image of work life had changed due to the Demola experience. The exchange students were the biggest group to agree to this, for as much as 77 percent of them either agreed or strongly agreed that Demola had an impact on

[31] The statement did not specify in which direction the image might have changed to, though.

changing their image of work life. Half of both international (50%) and Finnish (49%) degree students gave the same answer. The Demola experience had also an influence over what the respondents felt they wanted to do in the future. 46 percent of the international degree students felt that Demola experience had changed their thoughts about what to do in the future, 48 percent of Finnish degree students and 59 percent of the exchange students said the same (see appendix5, figure 10).

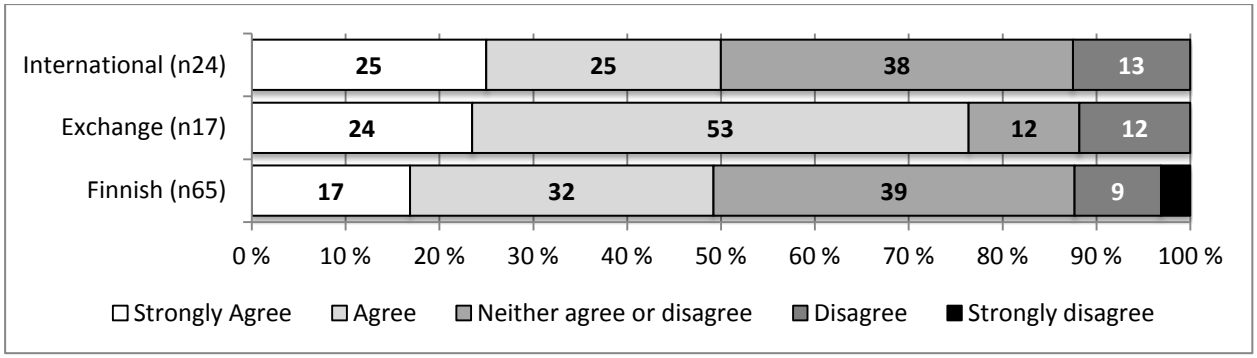

Figure 20. *My image of work life changed because of the Demola experience (N 106)*

"My current job title is game designer. Before my Demola project I didn't really know, what a designer does. During the project I realized, that this is, what I'm good at; bringing up ideas, developing, prototyping and visualizing them. This was highly needed in our project." – Finnish Degree Student in a Demola project in 2012

The results suggest that Demola seems to support the self-image of international degree students as innovative entrepreneurs even more than the Finnish students. Thus Demola seems to integrate foreign-human capital into innovation activities well.

5.6 Teambuilding in Demola

The survey also included question concerning teambuilding in Demola. Here questions about the students´ main contribution to the student team and experiences about teambuilding are discussed. Key focus is whether teambuilding in Demola attaches international students to the student team as well as the native students.

Students specified what they thought was their main contribution to the team. These answers could be categorized into four main contribution fields which were (1) management skills, (2) technical skills, (3) interaction skills and (4) creativity.[32] The *management* category consists of skills such as organizing abilities, project management and distribution of work. The *technical skills* category comprises contributions related to coding and game design. There were also respondents who underlined *interaction skills* as their main contribution. This category includes answers in which students state that their main input was their communication between team members and the way they were helping others. Here the respondents also brought up their ability to discuss matters with people from different cultural backgrounds. Moreover many students also described that their main contribution to the team was their imagination and new ideas. These abilities were categorized as *creativity.*

International students were the biggest group to state that their main contribution was creativity as 42 percent of them stated so. Meanwhile creativity was far less represented among the exchange and the Finnish degree students (exchange 13% and Finns 19%) (Fig. 21). Both the exchange students and the Finnish degree students felt that they supported their team the most with their technical skills (exchange 50% and Finns 42%). 40 percent of the exchange students thought that their main contribution were their management skills while only 21 percent of the international degree students and 31 percent of the Finnish degree students stated the same. Interaction skills were the least represented in every student group.

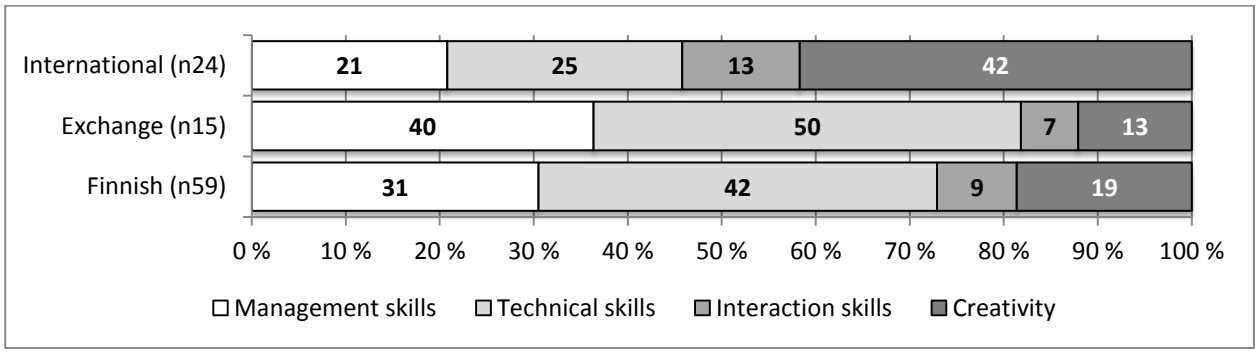

Figure 21. *Main contribution to the team by categories (N 98)*

The respondents felt that while working in teams they could bring up their professional competences well (Fig 22). This relates to teambuilding during the project. Teambuilding relates both to forming trust and hereby building social capital (see e. g. Román 2002; Naphiet & Ghoshal 1998). The respondents´ experiences of teambuilding were measured by looking at

[32] However, it is to be noted that some answers included elements from more than one category, yet, these answers are discussed only in one category based on what was the strongest point made by the respondent.

questions about how long they felt it took from their team to become functional both in the sense of weeks and meet ups of the team. Most of the respondents thought that their team was fully functional in two or three weeks (Fig. 23) and that it required two to four meetings to reach this point of functionality (Fig 24). The international degree students and the Finnish degree students were almost as positive about how long and how many meetings it took for their teams to become fully functional whereas the exchange students thought that the team building took longer and that more meetings were required for the team to reach functionality. One fourth of the exchange students also felt that the team never even reached functionality.

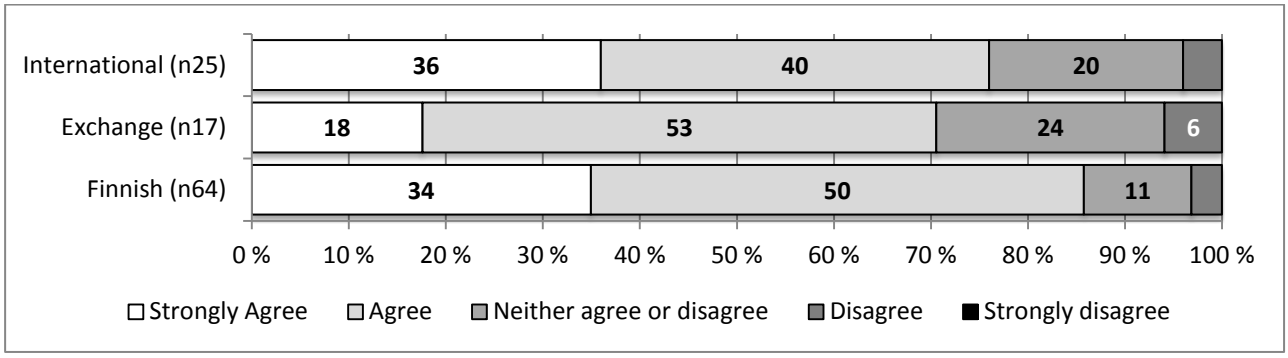

Figure 22. *While working in teams, I could well bring up my own professional competences (N 106)*

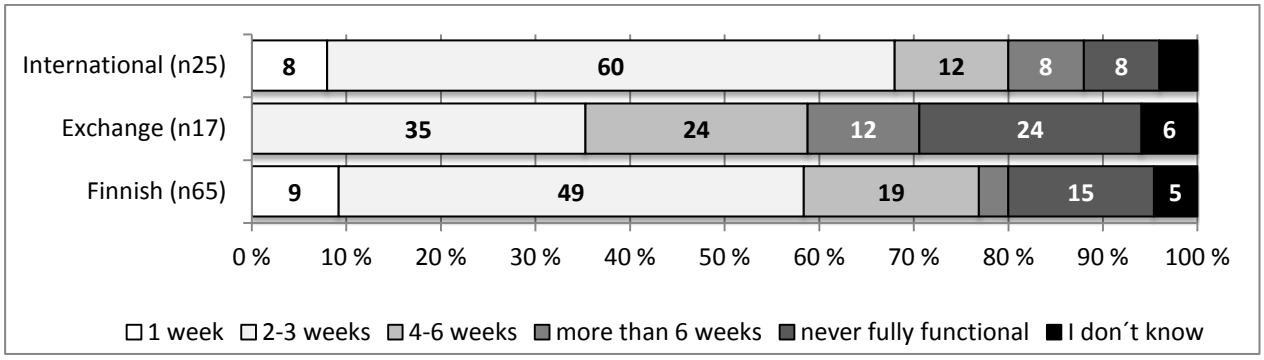

Figure 23. *How long did it take in your opinion before the team was fully functional? (N 107)*

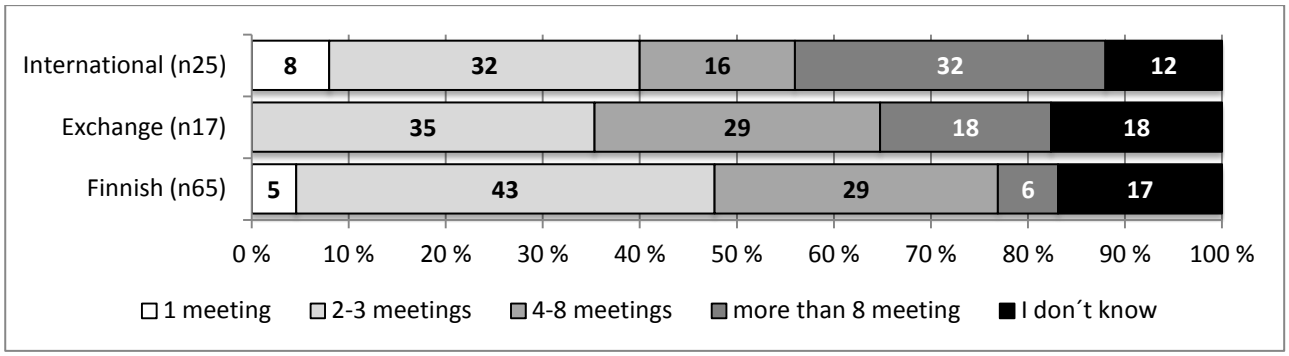

Figure 24. *How many meetings did it take for your team to become fully functional? (N 107)*

As the degree students (international and Finnish) felt more positive about their ability to bring up their professional competences and how fast the team reached functionality it may imply that when a student is more embedded into a local more permanent institutional structure also team building in Demola may be experienced more positive. Thus it may seem that deep embeddedness to a local university may support teambuilding in the Demola project, too. Hereby students with weak ties may never feel so related to their Demola team.

The building of mutual trust in the team was experienced in roughly related manner in all three student groups (Fig. 25). Majority of the students in all the groups felt that trust was built during maximum eight meetings but there were also respondents in every group who stated that the building of trust took more than eight get-togethers. The trust-building was also measured in weeks (Fig. 26). Here the international degree students were the most positive. Nevertheless the feelings of the Finnish degree students were well in line with theirs. The exchange students felt that the building of trust took more meetings or that trust was never reached. This also supports the notion that stable linkages to local universities may support integration, which might explain the differences between degree and exchange students in how teambuilding was experienced. Hence it may be implied that deep embeddedness to a local academic institution may support integration to innovation activities.

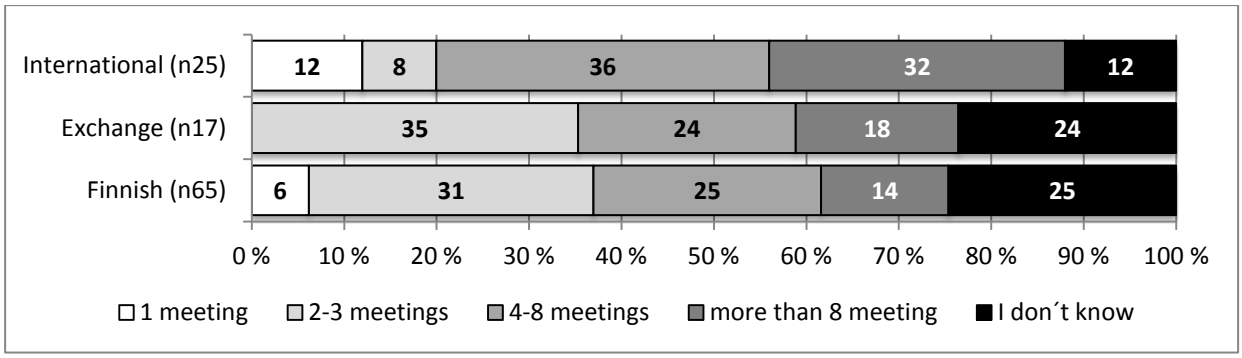

Figure 25. *How many meetings did it take for your team to reach mutual trust? (N 107)*

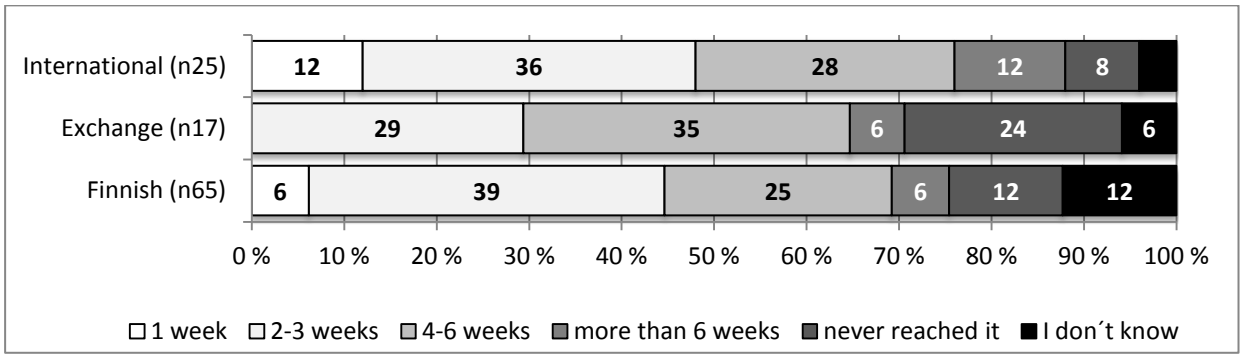

Figure 26. *How long did it take before your team shared mutual trust to each other? (N 107)*

Communication between the team members was altogether experienced to have worked well (Fig. 27) despite the feelings that the work load was not shared evenly, a statement that rose in every student group (Fig. 28). Almost half of the exchange students felt that their team did not succeed in sharing the work load fairly (47 percent of the exchange students disagreed, while 20 percent of the international and 22 percent of Finns disagreed or strongly disagreed). Moreover international degree students and Finnish degree students felt more positive about team spirit than the exchange students (Fig. 29).

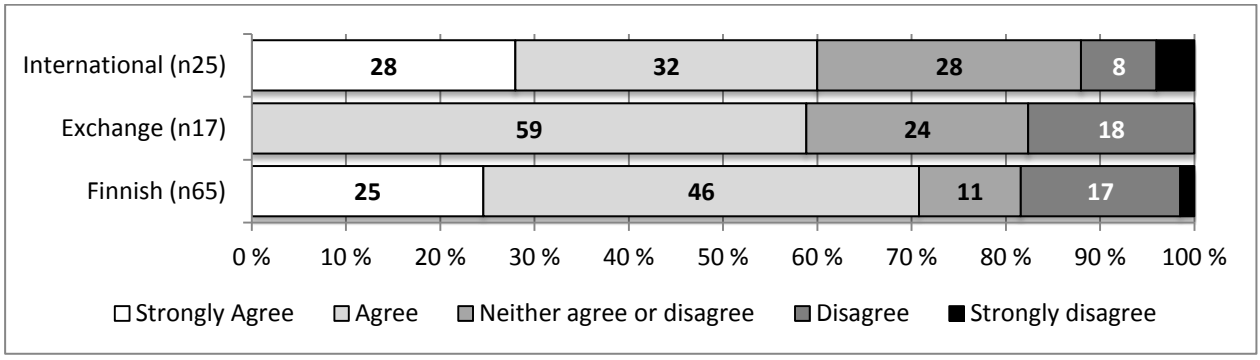

Figure 27. *Communication between the team was working well (N 107)*

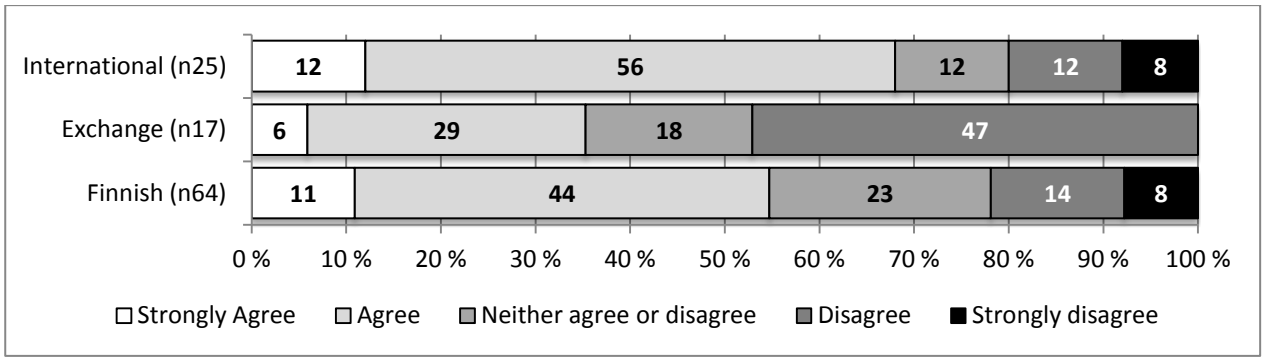

Figure 28. *Our team succeeded in dividing work load fairly (N 107)*

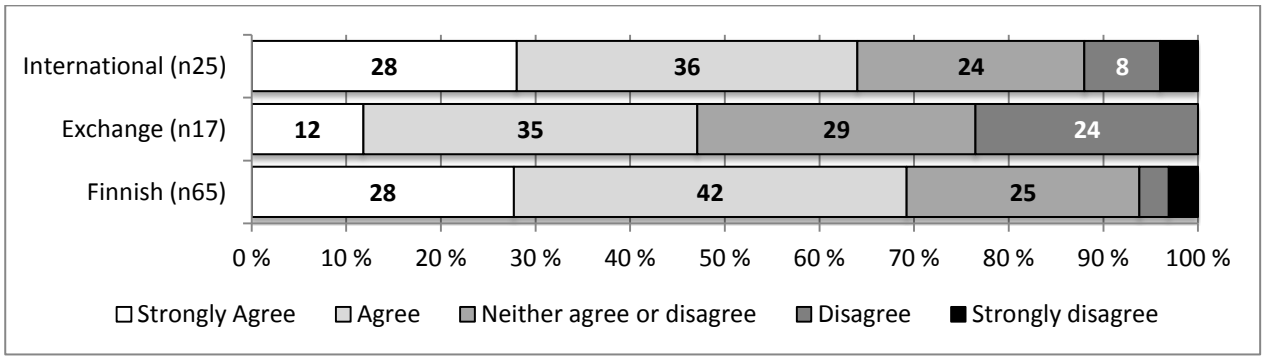

Figure 29. *Team spirit was high (N 107)*

Altogether it seems that international and Finnish degree students felt more positive about teambuilding than the exchange students. This may relate to different ties the students have established to the local universities. Due to strong ties maybe also the Demola project is experienced more important and thus students are more devoted to it, which in turn might support how they experience different dimensions of the project. Results might suggest that students with stronger ties experience the project more positive than students with weak ties when the student groups are compared. Thus exchange students may not experience team spirit so high because they are not overall so attached to the societal structures whereas the degree students have more local activities and institutions to support them. Here the role of local universities and the students´ relationship to them becomes important again.

Multidisciplinary combination of the team was experienced beneficial to the team more strongly among the international (67% agree or strongly agree) and the Finnish degree students (73% agree or strongly agree) than the exchange students (47% agree or strongly agree) (Fig. 30)[33]. Thus it may be that the degree students, who are more firmly linked to the local economy to begin with, are more beneficial to the multidisciplinary environment of Demola. The degree

[33] Consider *related variety* in chapter 4.4 (see e.g. Asheim, Boschma & Cooke 2011).

students seem to feel that the diversity of the team enriches the activities. This is supported by other findings presented in this study according to which it seems that they may learn more from the Demola experience overall and in addition feel more positive about team-building, too.

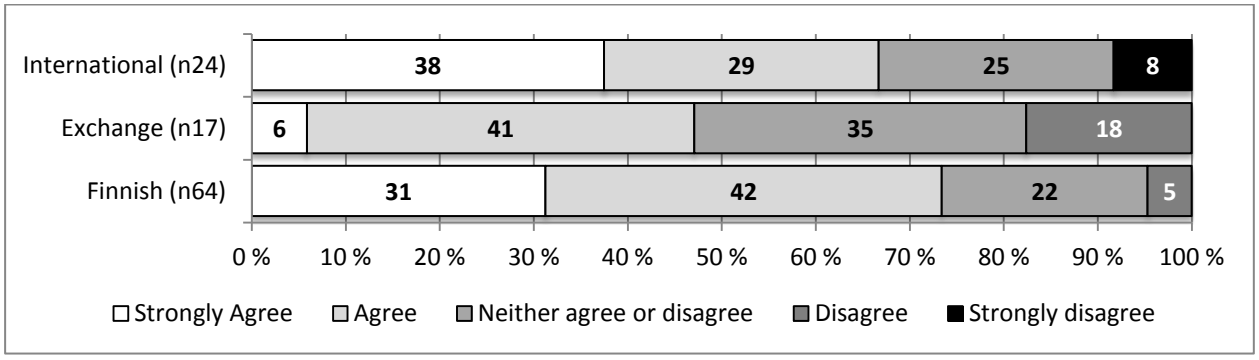

Figure 30. *Multidisciplinary combination of the team members was beneficial to the project (N 105)*

"Multidisciplinary cooperation is absolutely fantastic! Team spirit is [the] key to success and happiness." – Finnish Degree Student in a Demola project in 2012

"People have different skills and [it] is important to talk about them at the beginning of the project." – International Degree Student in a Demola project in 2012

"Some people just can't deliver what they promise and that can jeopardise the whole project if they don't share their problems in time. There was one person in our project group that kind of brought the spirit down in many cases as he hadn't done nearly any of the things he was supposed to." – Finnish Degree Student in a Demola project in 2012

The students were also asked whether they got a summer job during or after the Demola project (Fig. 31). Although this question was only for those who took part in a Demola project during the semester (the remaining 11 were working with the project in the summer) it is important to take a look at how many students got employed in each of the students groups. Forty percent of the international degree students and 39 percent of the Finnish degree students got employed during or right after the Demola project. There were not many exchange students, who got employed, but yet, there were some (12%).

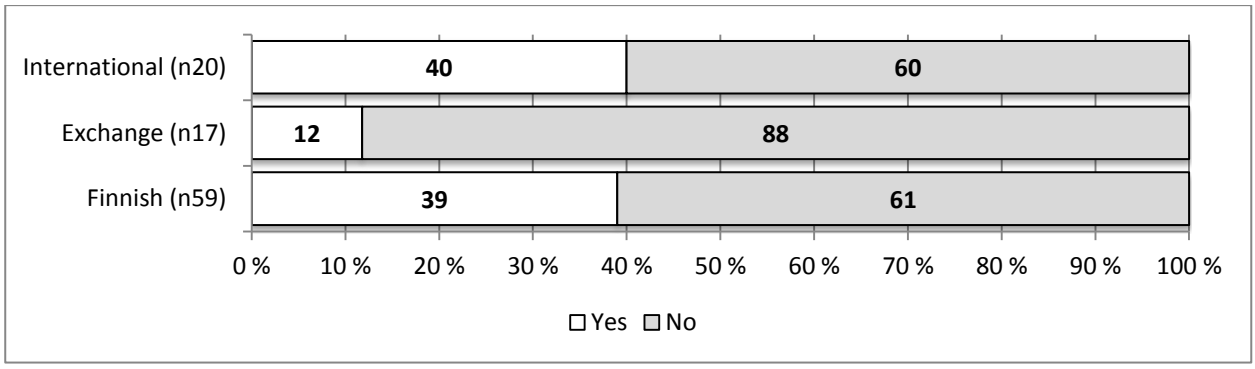

Figure 31. *Did you get a summer job during or right after the Demola project? (N 96)*

Teambuilding practices in Demola seem to function well for those international students that stay in the country longer but for those that spend only a shorter time in the country the process is not working so well. The results show that the exchange students were not so linked to the community and its incentives during the project as the international degree students. However, the reasons for this may not solely be explained by the length of the students´ stay in the country.

5.7 Results of Demola survey

Main goal of Demola was to answer how students integrate to innovation processes through innovation and development platform Demola and whether there are differences between the international and native participants. Based on the Demola survey it is suggested that international and native students may be equally involved in innovation activities. It seems that Demola works in integrating foreign-born students into regional innovation processes and that the differences in the integration processes between student groups are not based on their cultural background (international vs. native) but the reasons steam elsewhere.

Demola builds the self-image of students as innovative entrepreneurs, supports teambuilding and forms social capital by enhancing the formation of trust during the projects as well in the case of native and foreign students. In some cases the even better for the international students. During the Demola project especially international students show to learn interaction skills which are important when adjusting into a new cultural environment. Thus Demola seems to be working well in the integration of foreign-born students. Demola shows that innovation platforms may help to link regional innovation environment with foreign human capital, even in the case of one of the most challenging groups in Finland: foreign graduate students.

Finally as the results of the Demola survey imply that Demola as in innovation platform is integrating international talent to the regional innovation activities, further questions rise. It seems that to improve the integration process of its participants, an innovation platform needs other more formal institutional structures. The role of universities as such more permanent structures has been recognized and thus further research upon their role in the integration of foreign-born people into the local ecosystem and thus to local innovation activities should be more profoundly done. This leads us to ask to what extend do local economic players affect the invocation of global human capital and how may the regional image (of Tampere) be improved.

6 MICROSOFT AS A MULTINATIONAL CORPORATION

In this chapter I answer the question how a MNC establishes links to local innovation environment through platforms and community building. The key question addressed here is:

- *How global and local are linked together in a pioneer innovation platform?*

This was supported with three specifying questions:

  - *How global innovation platforms may facilitate growth in a regional economy?*
  - *How global innovation platforms participate to community-building practices within a region?*
  - *How local knowledge is utilized to benefit global means?*

6.1 Microsoft Innovation Centers

Microsoft Innovation Centers are global innovation platforms that are tapping into local resources and making these resources work in the benefit of the global company. Microsoft makes use of the different regional innovation potential with its worldwide network of Microsoft Innovation Centers by entering the local markets in multiple locations by establishing connections to the local economy and thus taking advantage of the local knowledge. This chapter will present Microsoft Innovation Centers as a point of reference of global innovation platforms.

Microsoft Innovation Centers are Microsoft initiative in which Microsoft works together with its local partners connecting students with a combination of government, academic and industry participants (Table 3). Microsoft has supported the local ecosystems with its investments strongly focused in developing regions´ commercial software. The centers are offering a comprehensive set of programs and services to foster innovation and grow sustainable local software economies including for example professional training. Primary areas of focus are on skills and workforce development (i.e. human capital), business and industry partnerships (i.e. social capital) and solutions and innovation (i.e. innovation). Each center is built to match the needs of the local economy and support its growth. While each center adjusts its programs to

local needs at the same time they provide similar content and services designed to accelerate technology advances. (Microsoft 2013.)

Table 3. *Microsoft Innovation Centers in a nutshell (Microsoft 2013)*

WHAT?	*"Technology centers offering a comprehensive set of programs and services to foster innovation and grow sustainable local software economies."*
WHY?	*"To connect people and organizations in the software ecosystem and give them access to resources, experts and facilities for collaboration and skills development."*
WHO?	*"Students, entrepreneurs, academics, professional software developers, startups, IT professionals, industry organizations and local governments."*

At the moment there are somewhat a hundred Microsoft Innovation Centers worldwide of which twelve are located in Brazil where the first center was also launched in 2001 (Curitiba). Also in Brazil the main objective of Microsoft Innovation Centers is to accelerate the use of new technologies, promote the national industry of software and raise the competitiveness of Brazilian segment internationally. More than 400 software projects and solutions have been developed around the XML open standard and other innovative technologies, in collaboration with 72 universities and numerous local governments and businesses. In 2010 alone, 7,500 students, IT professionals, developers, and academics took part in technology labs, skills development, professional certification training, scholarships and research in the Microsoft Innovation Centers across the country. (Microsoft 2013.)

6.2 Key Composition of the Centers

I visited three Microsoft Innovation Centers in Brazil (Belo Horizonte, Sao Paulo and Fortaleza) interviewing eleven people involved in the daily routines of the centers. They were either managers in the units, students participating the program, people representing the local host or otherwise involved with it. All the three centers are built differently and they are all strong in different areas. The composition of each of the centers has been set together to support the local economic environment. Two or the visited centers were partnerships between Microsoft and a local university (Belo Horizonte and Sao Paulo) and the third was a partnership between Microsoft and a non-profit organization (Table 4). Even though in Belo Horizonte and Sao Paulo the partnerships were both established with a university, the center´s activities were still very

different from each other. First, because the universities emphasized different fields and second, because the states in which the centers are located reflect different ecosystems. Part of center´s investments always comes from Microsoft. However, the centers also need other sources of income. Some were vey reliant on Microsoft´s investments but some were functioning depended on their own projects. The centers were also different in the length of the program, which was determined based on the local recourses. Moreover each center involved a different number of multidisciplinary students and had a unique recruiting program. None of the centers had any international degree students or exchange students in them.

Table 4. *Summary of the visited locations*

Location	**Partnership with**	**Facilities in**	**Investment**	**Length of the program**	**No of Students (interna-tional)**	**Student recruiting**
Belo Horizonte	Microsoft + University PUC Minas	University campus	Microsoft, Uni and local investor (BHS)	6 months	5 (0)	new ones every 6 months
Sao Paulo	Microsoft + University SENAC	University campus	Microsoft, Uni and different projects	2 years, 6 hours a day	23 (0)	8-10 new interns every six months
Fortaleza	Microsoft + non-profit R&D center Atlantico	Non-profit organization	Microsoft and Atlantico	volunteering 6 months 4 hours a day, up to two years in the center	5 (0)	new one in whenever a positions opens up

Most of the people I met considered that Microsoft Innovation Centers were not a conventional concept for Brazil. The program was not nationally unique but experienced more experimental than mainstream. The main difference to more traditional models was seen in that the students need to think for themselves instead of getting ready assignments handed over. Thus the MIC (Microsoft Innovation Center) program required that students have to think differently than in the more traditional courses. The centers target at low hierarchies between the supervisor and the student team. This is not traditional for Brazil either. On the contrary teacher is usually superior to the students and the classes are rather structured than open to discussion. However, each of the three centers was experienced as an open environment amongst the students and managers in which ideas could be shared and people were not afraid to fail or ask for guidance from others.

Teams felt that they shared the same opportunities with the other team members from whom they could also get support from when needed. Students have strong autonomy in the centers as they are encouraged to self-contained work spirit. Thus the students work in a very practical environment independently and know their responsibilities and these are also factors of motivation for them[34].

"Here you don´t do just the project - - you help with the clients, you have to take care of all the problems. You are the manager of the project yourself! This is very interesting to do." – MIC employee, Brazil

"They do all the things, they choose who they will count on doing this and this - - They don´t need anyone helping. The team members give each other support and that is enough. They know that they have to manage things by themselves, there is no one else, no one else will do it for them. - - Sometimes I let them do some mistakes because they learn more" – MIC Manager, Brazil

While Microsoft Innovation Centers are open environments for the students, at the same time they are rewarding but demanding environment for the managers of the centers, too. This is because the center itself is not an independent actor even though it has strong autonomy from both Microsoft and the local host.

"Being a MIC manager is fantastic but it is also very challenging. It is like having two bosses. It is having two bosses, we have to do what our partner wants us to do and we also have to do what Microsoft wants." –MIC Manager, Brazil

As outlined above, the key groups in Microsoft Innovation Center´s operations are the individual students involved, the manager of each unit, the local host and Microsoft. However, it is the students who are in the very core of each of the establishments. Therefore it was considered important to gather insights of the reasons for the students to participate the program. According to the interviews the students enter the program to improve their professional skills and get new competences career wise. They want to enhance their knowledge about the latest technical solutions and learn technical skills. Thus constant learning is part of every-day-life in the centers**.** This is seen in the way students interact and share experiences and knowledge and are not afraid to ask for guidance when they need it.

[34] See appendix 6, figure 1 *Innovation process in Microsoft Innovation Center (Source: Microsoft Innovation Center Sao Paulo 2012)*

"The fact is that I´m learning" –MIC student, Brazil

"Our mission is - - you are here to learn in the first place - - every day you will learn something new." – MIC Employee, Brazil

Students also wish to widen their business networks and get to know new people who may help them in this. This is important for it seems that in Brazil business is strongly built on social interaction and relationships are in an important role when enhancing one´s career. Therefore it becomes very important that students are networking already during the program and thus establishing connections to companies. This is accomplished either by taking part in *student to business* –programs (S2B), which are also open to other students from the universities located in the region or by every-day-practices in which the students collaborate with local companies in either joint project or assignments that have been handed to them. The high level of networking and collaborating with the local companies and academic institutions has created the MIC program a good reputation among the local actors. Thus having finished the program gives a good reference for a student.

"I don´t know no one that [anyone who] can´t get a job after the training" – MIC Employee, Brazil

"It´s not a permanent place: you get there [the program], you learn and you get out in a limited time, I don´t know, in a year or two and once you get out of here you can get into a very good place because it is a big deal at least in our market here that I´m a MIC student." – MIC student, Brazil

"We [Microsoft Innovation Center] provide them [students] to large companies here, they have jobs. They don´t have anything, they are students and by the end of the program they have jobs - - We hope that we provide the means for it [to be employed]" –MIC Manager, Brazil

"For the students -- Microsoft Innovation Center is a window to the world. They get to work with Microsoft professionals and it is a door to great careers." – Professor in a host university

Albeit money is not the most important factor to enter the program, to some students it may be more important than to others. For example some students are taken into the program to support the financing of their studies that might be impossible otherwise. However, also in these cases the professors have to feel that the students are determined and devoted to the program, and have what it takes to be successful.

"The students participate because they get important knowledge and they also get paid. They get the certificate of the participation, which is also important. They also meet with companies and build networks and this is important for the students to get employed later on." – MIC Manager, Brazil

The centers are established to each location only when the local hosts are devoted to the operations. The devotion steams from that they believe that the Microsoft Innovation Center will somehow benefit not only the host but the local ecosystem. The investments from Microsoft are highly valued but it is also generally believed that the *Microsoft* name may be of benefit for the local host and economy.

"Having Microsoft as a partner sometimes ... is an umbrella, it is something that helps. Microsoft names the contacts to Microsoft people directly. I can get my phone and call someone from the Windows team to help me with something. It is something you don´t have every day and not every company has" –MIC Manager, Brazil

"We try to match what Microsoft wants with what the partner wants. - - It doesn´t happen all the time but most of the time the partner lets me decide what is the best for the MIC and forget a little bit about what the partner wants because they see the partnership as [a] very valuable thing." –MIC Manager, Brazil

6.3 Microsoft Innovation Centers in the Local Ecosystem

Each of the three Microsoft Innovation Centers visited seem to be strong actors in the local ecosystem. They do not only provide education and training to the students involved in the program but they participate in other activities, too. They are bringing together local companies and providing start-ups with support networks. In addition they offer start-ups a channel to internationalize; Microsoft is keeping an eye on some of the start-ups supported by the Microsoft Innovation Centers and offering them pipelines to reach global markets. There is also importance on that while the centers are offering professional education to the students, the students are taking this with them to their future workplaces and thus spreading their knowledge there.

Furthermore Microsoft Innovation Centers are strongly connected to job generation and start-up activities. All the three Microsoft Innovation Centers that were studied had strong relationships to companies and sometimes students started their careers already in the middle of the MIC

program. In these cases the students had to leave the center sooner than estimated but the student teams understood this because employment was seen as a great opportunity. Also the managers encourage students to take on jobs that seem right for them even though for the center it would mean losing a member.

"Sometimes we change someone and he responses well and in six months or so he could be an employee in another corporation… and we actually encourage that" –MIC Manager, Brazil

Microsoft Innovation Center in Fortaleza is strong in providing training for students. It has implemented a government regulated project in about seven cities within the region involving 5000 – 6000 students in the program. In Sao Paulo there is a huge demand for IT professionals and companies are contacting the local Microsoft Innovation Center to recruit students directly from the center. However, even though the center is encouraging employment it does not want to recommend individual students directly to companies. Instead it arranges student to business – meetings (S2B program) to involve more students with companies and help in connecting suitable students to companies while providing all the students equal possibilities of getting recruited. The center in Sao Paulo is also strong on taking on assignments from local companies. This works in favor of both the students and the clients. The students gain valuable experience while working in the projects. The companies do not get the work from the students cheaper than it would cost in a professional company but the company gets fresh ideas and may also participate to education of new employees in a way that helps their education to match with the company´s job descriptions.

"Sometimes we spend more time on things than professional teams - - but on the other hand we can do something that anyone can´t do because we don´t have afraid to fail, they are students they are not afraid to fail – yet. This is good because we can do different things. – MIC Manager, Brazil

Microsoft Innovation Center in Belo Horizonte is also involved in training programs reaching 3000 students from local universities. The center is also part of *Bizspark* -program (Microsoft initiative) that supports start-ups in the region for a three-year-period through which it provides the start-up with a small monthly allowance. The program also includes free training and mentoring for the start-ups with the goal of creating a network of start-ups. These activities are monetary supported by Microsoft.

Individual Microsoft Innovation Centers are focused on local activities. Albeit the centers work under the same name in Brazil the connections between centers are weak both on national and international terms. Even though Microsoft arranges a national meeting for the managers twice a year and a global conference annually, neither of these activities involve students. However, Microsoft has arranged a global technology competition *Image Cup* fir the students to take part on annual basis. Also Brazilian student teams have participated in this. Even though Image Cup brings together students it only does this for a brief tradeshow: It does not encourage the formulation of more permanent forms of cooperation. Nevertheless even though the Brazilian Microsoft Innovation Centers have not established a regional network of innovation centers, the managers actually know each other well. Thus means for further development exists; event though this far the centers have only sometimes exchanged information online and no structured form for exchange of knowledge applies.

"We managers know each other very well - - so we know who is working with this and this and so on, so we sometimes create a bridge, we ask hey do you have someone there working with this technology - - could your guy help my guy over here and we establish connections - - everything is done online" –MIC Manager, Brazil

Nevertheless the members of the centers experience an interest to develop the concept further. Both national and international networks were found interesting. The main obstacles for these kind of development activities were found from legal issues and bureaucracy, which were found too overwhelming and therefore obstacles for the execution. The role of Microsoft Innovation Center was experienced problematic in the between the local host and Microsoft and thus policy making inside the center was ambiguous. However, the idea of sending and receiving students between Microsoft Innovation Centers was seen intriguing. Especially the managers felt that an international exchange program for the students would provide the students with a great opportunity to travel and see other places. Traveling would also offer them a change to learn new technologies better. The interviewees felt that since Brazil was not the leading country of technology, getting experience, different perspectives and a sense of how the world works could stimulate innovation in Brazil, too.

However, in order to establish international connection between students their language skills should be upgraded. Even though most people involved in the Brazilian Microsoft Innovation Centers knew English it was not the language used in every-day-activities. The centers were supporting the student´s language skills by encouraging presentations in English. Furthermore

the importance of English was acknowledged because English is the language in which new notebooks and up-dates are published. Therefore in order to be progressive one has to be able to study them in English for it takes time for the translations to be published. Despite of this many of the students did not pursue language studies.

The indolence of learning English and also pursuing international connections may also be a result of that the Brazilian home market is eminent. Therefore students do not necessary need to learn English for they will probably get employed anyway. This applies also for start-ups. They are not active in reaching international markets because they can be successful enough only by being big in the Brazilian market. Other reasons for the lack of internationalization were also estimated. People considered that for the Brazilian companies to go international it would require a significant level of innovation. Furthermore it was experienced that there were some significant cultural challenges for this. The interviewees acknowledged that in order to reach top goals high level of innovation would be needed. However, albeit the Brazilian students may be considered creative they were also estimated to lack in the hard work attitudes that would be crucial when establishing technical breakthroughs. For example among the computer science students the cultural habits were seen to be clear: students are ´lively´ and they lack in concentration to their studies.

"Students are very creative but they lack in being disciplinary. Brazilians are very open and talkative and this is bad to reach top results" – Professor in a host university

Nevertheless people involved with the Microsoft Innovation Centers did find establishing international connections interesting and saw potential for the students to learn new things by exchanging information over Brazilian borders. However, the centers were only now opening up to understand that in order to grow they would need to accomplish more collaboration within the region (so national and international networks were still rather far). At the moment most of the Microsoft Innovation Centers in Brazil are partnerships only between Microsoft and the local host. However, as it has been now acknowledged that the local ecosystems may not be boosted only by these single partnerships between two actors, the centers have tried to boost local innovation activities by involving more actors and pursuing new modes of networks in their operations. This has been executed by participating in local trade fares and other regional events with the aim of establishing more long-term partnerships with the local actors. The Microsoft Innovation Centers have tried to be more present in the local ecosystem to be lucrative to for example investors.

6.4 Results of Fieldwork in Microsoft Innovation Centers

Key focus of this chapter was how global and local are linked together. Microsoft Innovation Centers tap into local resources and making these resources work in the benefit of the globally operating MNC. Based on the fieldwork conducted in Brazil it was accomplished that the composition of each of the centers has been set together to support the local economic environment.

The motivation and incentives for students and the local partner are in the core of the centers. Even though the activities of Microsoft Innovation Centers are different, the students´ motives to participate the MIC program are parallel. They work to improve their professional competences, gain good experience and obtain new skills, knowledge and abilities technology wise they would otherwise lack. Students wish to build networks to business life and get employed. Participation in the program is considered as a valuable addition in one´s resume and it supports employment. Salary and student grants, gotten from participation are considered somewhat important but they were not the main incentives to enter the program.

The local hosts find Microsoft Innovation Centers beneficial, too. With the help of the partnership they have been able to establish new forms of education and gained access to new technologies and training. The hosts feel that the center is offering good education to the students it involves. The centers may offer competent, highly-skilled employees for the local companies and thus be involved in regional development activities.

Each of the centers visited seem strong actors in the local ecosystem. They connect regional actors together and contribute to knowledge-creation in the area. Microsoft taps into the local ecosystem by establishing a Microsoft Innovation Center in a region. This is possible partly because of the Microsoft name. The brand is known world-wide and especially in the IT world it may be related to success. Microsoft gains trust in the local market, and as local hosts see possibilities in the operations, they get into partnership with Microsoft. Microsoft has offered monetary support to the local actors, which has been a way to encourage them to get involved. Microsoft gives the centers strong autonomy: centers may do what they want as long as they accomplish funding for it themselves. Microsoft only supports activities it feels are in line with the company´s agenda. It is important that the local hosts do not feel that they are controlled or compelled to anything. It seems that Microsoft has acknowledged that in order to make the most

out of the partnerships, the local partners must feel that they are getting more out of the relationship than they are putting in.

The centers are strong on the local market but national and international connections lack. Establishing both national and international networks were found interesting but the execution seemed too overwhelming. Especially the role of Microsoft Innovation Center was seen problematic as it is set somewhere in the between of the local host and Microsoft making policy making inside the center ambiguous. To form international connections between students in different countries, their language skills should be upgraded. The indolence of learning English and pursuing international connections may also be a result of that the Brazilian home market is eminent. The centers were only now acknowledging that in order to grow they need to collaborate more at least within the region. It seems that the centers (and the whole Brazilian economy) are in a critical point and facing significant changes.

Microsoft has participated to community-building practices in the region with different programs the Microsoft Innovation Centers concept supports. Support has been directed to specific operations that bring together students, companies, academia and government actors. Different actors have been able to start compiling networks and setting up communities. However, it may be seen that these actions have been executed by Microsoft to strengthen its own role in the local market and make its own technology stronger.

Microsoft makes use of the local knowledge in several ways. Some units work directly for Microsoft by developing apps. The local actors pursue this because they experience that the activities favor the students and their skills development. The students also get access to the newest technology, which they would not otherwise have. This may give them competitive advantage in the labor market. It may seem that Microsoft is merely pursuing its own goals by introducing its technology and thus strengthening its position in the market, but the positive outcomes of the centers may also be considered to be evident. Many centers have contributed to development activities in the region due to the support of Microsoft and therefore Microsoft may be experienced as an accelerator of development. Microsoft has introduced a concept and courses of action before unfamiliar to the local economies. The economies that respond well may take a lot out of the partnership. It seems that the model is working best in areas that would not afford to make investments to start up such activities themselves but with the help of Microsoft the activities have been established and taken further. In sum platform policy from global to local level (compare Demola) is a sufficient model of operation.

7 DISUSSION AND CONCLUSIONS

This study has contributed to the policy discussion on regional development and internationalization by studying how innovation platforms may integrate human capital to innovation activities. People are now more mobile than ever and as there have been implications that diversification of knowledge base may enhance innovation and thus increase economic growth, the importance to understand the formation of global human capital has become a central issue in regional development policies.

Policy relevance is related to the globalization of innovation practices and how local and global are linked together. The focus is on practices that support the emergence of innovation communities and innovation platforms. This has been discussed by concentrating on the integration of global human capital into Finnish innovation activities and how a global MNC may link to local recourses.

According to a literature review concerning globalization of innovation communities, interest towards the study field has grown within the 20th century and especially during the last few years. According to the review innovation communities work as sources of knowledge, which may be seen as their key quality. They have also enabled global transfer of tacit knowledge. Knowledge is produced in different contexts and it is exchanged in communities to create economic growth or to enhance competitiveness.

Innovation communities may be categorized based on their spatial and temporal terms. On spatial terms the division can be made between communities that are located in one place and aim to adjust to global interaction and communities that are dispersed to different parts of the world and take advantage from their diverse and extended knowledge bases. On temporal terms communities are divided to communities that are long-standing or even virtually permanent and fast-evolving or even temporary. Globalization is a generic context for communities, and in most cases the role of community is either to ease the adaptation or to enhance the sought of opportunities in the new context. This may be seen on how innovation communities reach to build global connections and link these global connections to the local level. In sum, innovation community is a promising but still a vague concept that still needs to be developed. In this study the following definition was used based on empirical work.

Based on a small screening conducted of innovation communities in Finland four approaches to innovation communities that facilitate the integration of foreign human capital into innovation activities could be found. These were Business Networks, Immigration Communities, Expat Networks and Innovation Platforms. Innovation communities attribute to the combination and creation of knowledge and thus to the integration of global human capital. There are spatial and temporal differences in the communities´ structure. It seems that some communities are more global than others while some are more embedded in local activities. Some communities are more long-lasting while others are based on specific projects. There are differences in the operational environment the innovation community links people to. Some communities emphasize more innovation and innovative activities while others are based more on innovation-related activities.

Most successfully people are integrated into innovation activities in innovation platforms that work as policy-tools supporting the emergence of innovation communities, not purely as innovation communities. Innovation platforms support innovation processes and link people into innovation activities involving also foreign-born people. Closer scrutiny of innovation platforms showed that the fuel burned by the innovation platforms may be seen in the power of diversity. Platforms are established by identifying future socio-economic circumstances and thus creating competitive advantage by this identification and combining different resources. Competitive advantages are based on the dynamic capabilities of the diversified actors working for the platform. (Uotila, Harmaakorpi & Hermans 2012.)

Innovation platforms aim to solve the problem of proximity and distance. They are based on the identification of the existing regional resources and are fundamentally future-oriented. (Uotila, Harmaakorpi & Hermans 2012.) They must always be designed for people and match with their individual social needs (Karppi 2012). Innovation platforms may also provide a greater emphasis on students´ part in innovation processes due to students´ role in universities that are connected to innovation platforms and thus nowadays to a greater extend to regional innovation activities (Raunio & Kautonen 2014).

Research over innovation platforms is supporting theories about the importance of global human capital in regional development. These results are in line with an idea that combining global knowledge resources may favor regions. Moreover, it seems that innovation platforms may have the capacity to accelerate this. The case study of Demola showed that Demola seems to integrate

foreign-born students to innovation processes at least as efficiently as Finnish students and that Demola works as a tool to build global innovation communities.

International students that spend a longer time in Finland indicated of having learnt interaction skills from their participation in Demola. This is significant because integrating into a new environment always requires adjusting to new ways of interaction and this adjustment has been a problem to involve foreign-born people in the Finnish economy. Therefore it seems that innovation platforms may help to link regional innovation environment with foreign human capital even in the case of one of the most challenging groups in Finland: foreign graduate students. The challenge has been how to retain foreign graduate students in the country and Demola has proven to be an adequate instrument to support their integration. The level of embeddedness in a local more permanent institutional structure may support adhesion to the Demola community and invocation of the learning processes.

After concentrating on Demola and having found that the integration process offered by it works the same for students despite of their cultural background it came interesting to study how global and local may be linked together by a globally operating MNC. The results from Brazil suggest that global MNCs may tap into local innovation systems efficiently. In order to do so they have to be designed to match with the local ecosystem. This supports also recent studies about how innovation platforms have to be designed to match with the individuals and their social needs (see e.g. Karppi 2012).

When considering the situation between Microsoft Innovation Centers and Demola, the main difference is that Microsoft Innovation Centers are global in nature and they are trying to tap into the local ecosystems whereas Demola is working from the local level wherefrom it is establishing global connections by linking foreign-born people into innovation processes. Microsoft Innovation Centers are trying to harness local knowledge to benefit global means and Demola is trying to utilize global knowledge to benefit the local economy and to give participants unique learning experiences[35]. As studying them both shows, locality is important in both cases. Establishing connections (either local or global in nature) requires meeting up with the expectations of people involved in the activities.

As students have become more important actors in regional innovation activities, observing their motives of participation in innovation platforms is evident. The results from Brazil suggest that the incentives of students to apply to the MIC program are related to improving their

[35] This should not be forgotten. Demola is also a pedagogic tool.

professional competences, obtaining new skills and knowledge. They wish to widen their networks to the local business field to get employed. These motives are similar to what students participating Demola have. In Demola the strongest group to pursue these motives was international students that spend a longer time-period in Finland.

The motives of participation being the same in Finland and in Brazil, it is suggested that innovation platforms may offer the same content on a global perspective regardless of the socio-economic environment. Hereupon the facilitation of regional growth seems reliant on the attractiveness of the innovation platform. If the innovation platform is desirable in the eyes of the key composition involved in the operations, it is also likely to benefit both the accelerator and the region in which it is located in.

Demola teams form global innovation communities inside the innovation platform and therefore it seems that Demola is part of forming and supporting the formation of innovation communities. Not only does Demola bring people from different cultural backgrounds together it is also strongly part of introducing foreigners to native students. Research shows that international study environment may also be seen to have direct positive impacts on the national students, as it is believed that international environment increases flexibility in the labor market and hereupon also the national students may adjust better to the global competition on talent (Suter & Jandl 2008). Hereupon Demola is also helping the national students to adjust better to the new operational environment, which is suggested in that the cultural diversity was experienced beneficial for innovation in the project teams.

Microsoft Innovation Centers also bring together a multidisciplinary composition of students and introduce them with new technologies and connect them with the local business field. Even though the centers do not directly offer global channels there are supportive activities for start-ups to pursue internationalization. The centers participate to increasing social capital in the region by bringing together students to exchange knowledge and to learn from each other. Thus the centers engage in generating competitive advantages for the region. Also based on the research conducted in Demola it seems evident that the Demola model is supporting innovation and regional development. This may have long lasting effects to the regional competitiveness. Regional development is linked to the increase of social capital (Alburquerque et al. 2002) for social capital increases the efficiency of action and diminishes the level of opportunism. The latter may be seen as a consequence of trust. (Nahapiet & Ghoshal 1998, 246.) Trust between the

social agents facilitates co-operation and creation of networks and increases the feeling of security (Román 2002, 38).

The Demola case supports the findings of how social interaction is important when blending into any social group. The case study shows that it is important that the individual feels both welcomed in the group and that the expectations of the team members are parallel. This strengthens the integration process for the objectives of the group and the individuals forming the groups should be in line for the integration to take place in full speed. If the group is not deemed as too important in the opinion of the member, also the integration process is slower because the individual does not relate to the team. This is supported by the research conducted by Bathelt, Malmberg and Maskell (2004) for they acknowledge that the local activities are always dependent on the social environment and the actors involved, therefore the knowledge exchange is always related to the people.

Microsoft´s model of tapping into the local markets by establishing partnerships with the local actors is efficient. This model is also build on trust. By establishing partnerships with the local hosts Microsoft gains trust in the local ecosystems. Microsoft might pursue other ways to assure its position in the different local markets, too, but partnership model seems to be working. With other ways Microsoft might end up using a lot more money in order to gain the same it is reaching with Microsoft Innovation Centers. By investing in the centers Microsoft might still use only a fraction of what it might have used in marketing costs to otherwise link with the local resources. This relates to the benefits of requiring social capital: Social capital may enhance the achievement of other objectives that might be impossible to reach without the social dimension or only with an extra cost (Nahapiet & Ghoshal 1998). Therefore it seems that also a global MNC may use local social and human capital assets for its benefit.

As said, Microsoft has succeeded in establishing connections between global and local with its innovation centers. Even though Microsoft has pursued its own agendas with the centers, it is obvious that the regional economies have generated growth with the establishment of the centers. It seems that the centers work the best in areas where the local ecosystem cannot afford to make investments itself but may gain a lot and pursue growth with the help of outside initiative and support. Hereupon it seems that MNCs may facilitate growth in a regional economy by tapping into the local knowledge processes. This may be done by establishing a win-win-relationship between the local actors and the MNC.

Innovation platforms need to be lucrative to attract the right kind of participants. Microsoft as a brand is known worldwide and therefore local actors may attach it to success and want to be part of the concept. Microsoft is reaching the local markets by giving the local actors a strong level of independency. By giving the local actors access to Microsoft technology the company is supporting its role as a leading technology. However, despite driving its own interests it seems that Microsoft is also contributing to knowledge creation in the local ecosystems. Microsoft makes investments in the centers´ operations, supports the centers with technology and gives the local ecosystem a concept to build the center. These factors support community-building and may make it easier for the local actors to involve new people in the activities. Thus Microsoft Innovation Centers seem to bring together local actors and enable knowledge creation in a specific region. This knowledge may then be channeled forward to benefit Microsoft.

When considering ways to strengthen a region by planting an innovation platform in the area, the platform has to match with the socio-cultural environment. In the Finnish context this might mean offering social and professional networks to foreign-born students to support their integration whereas in the Brazilian context this could mean offering the local economy new ways to organize innovation activities. Also other supportive activities should be kept in mind. In Finland the research implied the importance of supporting the students´ integration process with other local structures.

This study suggests that students integrate to innovation processes in innovation platforms through professional and social interaction. Integration begins from integrating different kinds of competences through participation in team work. Team building concerns communication and interaction and these activities tie students into human and social capital activities. While the individual competencies are favoring the whole team, a learning process is going on continuously. It seems that integration is supported, when students feel they can bring up their professional competences in team work and they experience that the team has reached mutual trust between its members and is fully functional. It seems that integration always involves similar elements that are connected to interaction, communication and learning.

The model of innovation platforms may be roughly replicated into different regions when the local features are taken into consideration. It seems that this is done best when the global actor has local agents working in its benefits. Also a dual beneficiary relationship is required in order for the global company to permanently set into a local ecosystem and be profitable. The ingredients for a successful innovation platform are always dependent on local needs and there is

no single receipt for it. With the right kind of networks also independent regional innovation platforms might be beneficial for each other in the means of knowledge exchange and problem solving.

Hereupon it seems that students are strived to be more firmly attached into global innovation activities by offering them channels of participation. These channels have to be lucrative enough to offer the students motives and incentives to get involved. Innovation platforms involving students may be global in nature, thus they may consist of multinational compositions of students. Innovation platforms may introduce people from different cultural backgrounds to each other. As research has shown innovations generally occur when combining different knowledge bases and expertise and that the diversity of opinion is a way to increase knowledge (Nahapiet & Ghoshal 1998). Knowledge creation has been turning more and more from individual actors to communities and thus the multinational team structure for example Demola offers may be seen as an efficient driver of innovation.

In sum, as recent studies suggest, integrating global human capital to regional economies is important. Diversification of knowledge capital may enhance economic growth and thus strengthen a region. According to results of a survey conducted in an innovation platform Demola, Demola seems to be such a tool to integrate global human capital into local innovation activities. Microsoft Innovation Centers as a point of reference reminds of how locality is important when establishing innovation platforms. The local ecosystem plays a significant part in the formation of an innovation platform. This becomes obvious when considering the differences in the market structure of Finland and Brazil. Whereas the Brazilian market is self-sufficient, Finland with its small home market needs to establish global connections. This also influences the composition of innovation platforms and their fundamental function of subsistence.

Consequently this study supports recent research on that global human capital may be linked to innovation activities by linking people into social and professional networks within the area. Innovation platforms have an intensifying role in regional development and linking local level to global activities. Innovation platforms may offer networks to people and thus have attributes to support the formation of global innovation communities. Platforms bring together a global composition of talent and link them to the local economy. Hereby it seems that not only do innovation platforms participate to the formation of global innovation communities but they seem to be generators of such global compositions. Therefore innovation platforms may also be

seen as factories of global human capital. Further research about the formation of global human capital and structure of innovation platforms is still required.

It may be contemplated whether these results could have been achieved otherwise using other methodological approaches to the empirical data. To begin with the screening, it may be estimated that snowballing and open interviews were the best ways to start when trying to map certain features and expand general comprehension of the phenomenon. Demola survey was a completed set of data and using it for the means of this research is therefore beyond dispute. Considering fieldwork executed in Brazil thematic interviews and participative observation were chosen because of recourses. Given the limited time proceeding this way was even apparent. Therefore, it is to be noted that certain objects of study and compositions demand particular working methods. Thus considering righteous or sensibility of this study and its ensemble it may be considered that the formation and execution were even indisputable.

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APPENDICES

Appendix 1

Table 1. *Frame to deduce the relevance of the article*

Hakusanat:	Määritelmä: innovation community	Määritelmä: innovaatio	Aineisto(t), ml. toimiala, yritystyyppi, kohdemaa(t) yms.	Menetelmä(t) -kirjallisuusanalyysi -haastattelut -kyselyanalyysi -tilastoanalyysi -tms.	Miten globaali/kv./ylikans. on käsitelty ja/tai määritelty?	Keskeiset tulokset ja johtopäätökset
Title: **Author(s):** **Source:** **Volume:** **Issue:** **Pages:** **Published:**						

Appendix 2

Questionnaire for the survey

1. I am
    a. male
    b. female

2. Age ___

3. My study field is

4. What kind of student are you?
    a. Finnish degree student
    b. International degree student
    c. exchange student

5. How many academic years have you studied? ____

6. Graduation year or planned graduation _____

7. What is your current mode of employment (you can select more than one)
    a. entrepreneur
    b. employee
    c. student
    d. other, please specify _____

8. Start year of entrepreneurship? _____

9. Does your current entrepreneurship match to your educational field?
    a. yes
    b. no

10. Start year of the present employment? _____

11. Current employer _____

12. Does your current employment match to your educational field/level?
    a. yes
    b. no

13. How did you find Demola?
    a. Demola´s road show
    b. Demola´s web site
    c. Social media
    d. University´s info
    e. Personal networks
    f. from newspaper or other traditional media
    g. from other unspecified source? _____

14. What is the number of your Demola projects so far? _____

15. When did you do those projects? _____

16. What kind of projects they have been like? _____

17. Level of project _____

18. How important are/have been the following reasons for you to attend a Demola project/s?

	1	2	3	4	5
Getting contacts to business field/companies					
Enhancing the formal professional competencies					
Getting credit points					
Getting money					
Enhancing the quality of my thesis					
Increasing practical competencies					
Getting to learn new skills					
Getting work experience					
Getting to know people/make new friends					
Project gave me an opportunity to work in historical premises					
Project gave me an opportunity to work in the city centre					

19. What do you think about following statements?

	strongly agree	agree	neither agree nor disagree	disagree	strongly disagree	I don´t know
My reasons to attend Demola project(s) were mainly fulfilled						
Due to the Demola experience I learned a lot about myself as an employee and as a team member						
While working in teams, I could well bring up my own professional skills						
My Demola experience increased my self-image as a professional						

20. What do you think was the main contribution you gave yourself to the team?
_____

21. What is the most important thing you learned while working at Demola?
_____

22. How long did it take in your opinion before the team was fully functional?
    a. 1 week
    b. 2-3 weeks
    c. 4-6 weeks
    d. more than 6 weeks
    e. I feel that the team was never fully functional
    f. I don´t know

23. How many meetings did it take for your team to reach this point?
    a. 1 meeting
    b. 2-4 meeting
    c. 4-8 meeting
    d. more than 8 meeting
    e. I don´t know

24. How long did it take before your team shared a mutual trust to each other?
    a. 1 week
    b. 2-3 weeks
    c. 4-6 weeks
    d. more than 6 weeks
    e. I feel the team never shared mutual trust to each other
    f. I don´t know

25. How many meetings did it take for your team to reach this point?
    a. 1 meeting
    b. 2-4 meeting
    c. 4-8 meeting
    d. more than 8 meeting
    e. I don´t know

26. What do you think about following statements?

	strongly agree	agree	neither agree nor disagree	disagree	strongly disagree
Communication between the team was working well					
Our team succeeded in dividing work load fairly					
Our team succeeded in managing time during the project					
Multidiscipline combination of the team members was a beneficial to the project					
During the project I learned a lot about team communication which will be beneficial in my future work					
Team spirit was high					
I'm personally satisfied with the project's results					

27. Have you learned something specific from the other team members?
    a. yes
    b. no

28. If yes, what? _____

29. What do you think about following statements?

	strongly agree	agree	neither agree nor disagree	disagree	strongly disagree
Due to the experiences in Demola I made some changes to the courses to study					
Due to the experiences in Demola I decided to acquire new skills to my professional competence					
Demola experience makes/made me graduate earlier than planned					
Demola experience affects/affected to the topic of my thesis					
Due to the Demola experience I will be/was able to finish my thesis earlier					

30. What do you think about following statements?

	strongly agree	agree	neither agree nor disagree	disagree	strongly disagree
Demola experience correspond well to my goals for working experience					
Demola experience changed my attitude to temporary project work more positive					
I think working in a Demola project significantly differs from the regular work on my field					
Entrepreneurship started to look like a good career choice to me					
Demola experience changed my attitude to entrepreneurship more positive					
My image of work life changed because of the Demola experience					
Demola experience changed my thoughts about what to do in the future					

31. What do you think about following statements?

	strongly agree	agree	neither agree nor disagree	disagree	strongly disagree
I will return to Finland after my exchange period					
Demola has affected to my intentions to return					
Demola is a typical Finnish work organization					
Demola is an internationally spirited work organization					

32. Did you get a summer job during or immediately after Demola project? (only for students participating during the semester)
    a. yes
    b. no

33. If yes, which company? (only for students participating during the semester)
    _____

34. Was there enough leadership in your team?
    a. yes
    b. no

35. How was this leadership visible? _____

How would you rank you own readiness to take leadership in a team? (1=very weak, 5= very strong)

Appendix 3

Interview questions for Microsoft Innovation Centers

THEMES

- Person´s own background
- activities at MIC (practical activities)
- motives/incentives (why invoved)
- internationalization and connections to other MICs (collaboration)
- Microsoft´s role (leadership)

Your personal role in MIC?
-For how long have you been involved in the center?
-How and why did you get involved? (motivation?)
-How would you describe your role in the center?
-Working full-time?
-Different roles or affiliations/connections to either one´s own company or background in a university

Describe in your own words what the center is doing? (key challenges to run MIC successfully in general)
-What are the key tasks and their specific characteristics (that make MIC special environment for innovation)? (and is there specific technology or application, that is in the key role?)

How did the MIC (or some of its operations) start in BH?
-Was it easy/difficult to get different actors involved? Who were thy key actors? (and are they still active or are there new prime movers? (maybe why?)

Has the involvement in the MIC met with the expectations you had to begin with?

What is the composition of MIC community here? (key challenges for community building)
-How many people get salary?
-funding?
-Student groups and teacher and their relationship to the MIC?
-Different companies and their relationship?
→ How are these different groups linked with the MIC?

How do people usually get involved with the activities in the center?
(Are they more like invited/recruited, or do they involve proactively themselves?)
→The motivation and benefits to do so: Are there any special incentives to built cooperation between different actors in the MIC? (community building)
- If yes, what kinds and which of them seem to be working?
-How would you describe the reasons different parties have to get involved with the center?
-What benefits would you consider the MIC to have for different parties?

-What is there in it for the students/firms/entrepreneurs/university/technology center/science park/R&D center?

Are there some specific community building practices, to make people, often from different organizations, and with different backgrounds, to come together?

What are international practices in MIC? (what are key challenges for internationalization)

links with global partners, people or other MICs?

- do they link local economy with actors abroad (and if yes, how: business to business co-operation, investors from abroad, co-operation among universities, foreign students, foreign entrepreneurs, etc. – specific practices)

What kind of aims does the MIC have in internationalization?

- Are there any specific ideas, or attempts to recruit people from abroad, or attract international students, etc. to make MIC more international and multicultural from inside?

-Is it focused on global markets/Brazil/South-America/America?

-Are there established connections to other MICs in Brazil or in other countries?

- -Are the companies, people or knowledge moving between MICs within Brazil or on a global level?

Role of MS as host organization?

-About managing a MIC: is the leader of the MIC employed at Microsoft and how is Microsoft visible in every-day life of a MIC?

- Do the MIC managers have common meetings?

Does Microsoft give a lot of instructions or guidance on how to run the MIC or is it merely about making strategic guidelines about the goals of the center?

Lastly, do you consider MIC as an innovation community or –platform to be conventional practice in Brazil? (Does it fit to the country why yes/why not?)

Appendix 4

I also want to draw attention to the fact there had overall been a growing interest towards the study field of innovation, not just the globalization of innovative activities. Here I want to fit the numbers into proportion considering the whole study field of innovation by presenting that there has been growth in other fields of innovation study, too. Hereby it is important to alleviate that the role of global innovation communities is not the only area of interest in innovation studies. In order to fully understand how interest towards innovation study has changed within the 20th century I conducted more searches using the Web of Science. I wanted take a look at what kind of development there had been in innovation study whereupon I conducted a search using only *innovation* (or related terms) as a search topic. Again my focus was on the development in the number of annual publications and citations in each year from 2000 to 2011.

With this search I found that the number of published items p.a. had increased from being 847 in 2000 to 3026 in 2011 (innov*) (Fig. 1). This presents a three point five-fold increase in the number of published items from 2000 to 2011. The searches my study is focused on show growing rates of 8 (innov* and communit* and glob*), 8.5 (innov* and communit* and internat*) and 0.5 (innov* and communit* and transnat*). The growth can be considered to be rather intense in both innovation study and in the globalization of innovative activities. In addition I focused on the increase in the number of annual citations in the search considering the general field of innovation study. There is a parallel growth in the number of citations to the number of published items. The citations in each year show a growth from 1312 citations in 2000 to 2238 citations in 2011 (publications 1994 onwards).

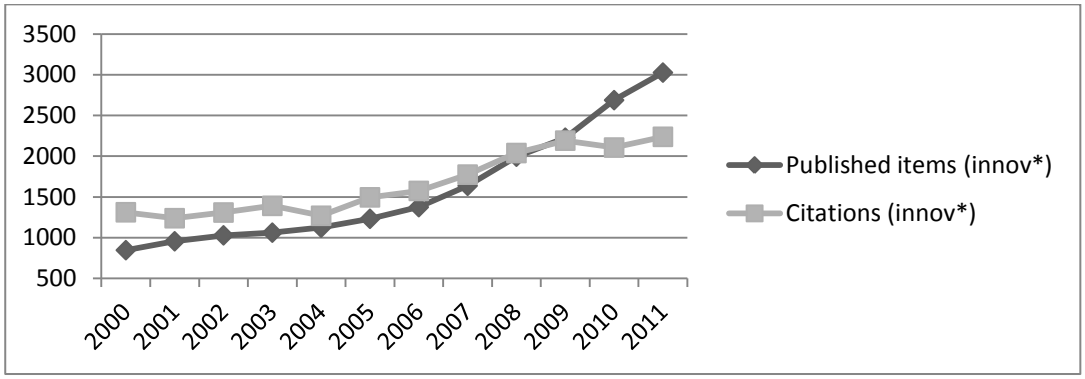

Fig.1. Published items in each year and annual citations from 2000 to 2011 (in citations: publications 1994 onwards perceived) (source: Web of Science)

I also focused on the published items concerning the globalization of innovation. I conducted three more searches using the Web of Science. With these three searches I wanted to gain understanding of how the interest towards globalization of innovation had changed between the years 2000 and 2011. The search topics were *innovation* related with:

- global/globalization/globalizing (glob*) or
- international/internationalization/internationalizing (internat*) or
- transnational/transnationalization/transnationalizing (transnat*)

This how I ruled out the topic of community in order to get a good picture what kind of development had there been in the study of globalization of innovation. Again I was focused on the number of published items in each year and the number of annual citations.

There were 69 published items in 2000 when the number had increased to 335 by the year 2011 (innov* and glob*) which shows a 4.8 fold increase (Fig. 2). As for another search (innov* and internat*) shows a multifold increase from 86 published items in 2000 to 295 items in the year 2011: the growth is 11.3 fold. In the third search (innov* and transnat*) the numbers are more composed, from 6 published items in 2000 to 17 published items in 2011. This generates a growth rate of 2.8 fold.

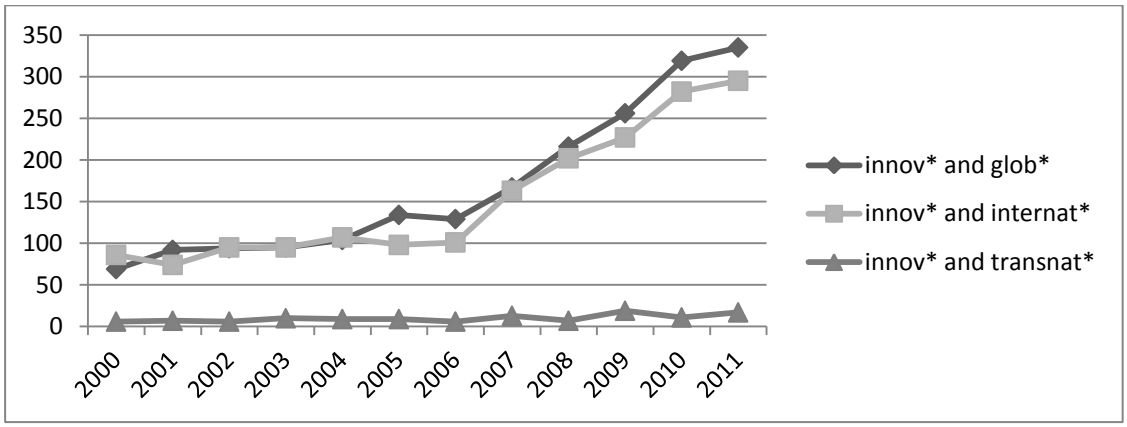

Fig. 2. Published items annually from 2000 to 2011 (source: Web of Science)

When I focused on the number of citations each year I also took into consideration the publications 1994 onwards (Fig. 3). The number of citations had increased in all the three searches. In the first search (innov* and glob*) the number of citations had experienced a tremendous increase from 404 in 2000 to 6028 in 2011. The second search (innov* and internat*) showed us a parallel growing curve from 378 citations in 2000 to 5627 citations in 2011. The third search (innov* and transnat*) features much more moderate numbers but when

the rate of growing is considered the phase is actually even more intense than in the first two searches. There had been 14 citations in the year 2000 and already 385 citations in 2011.

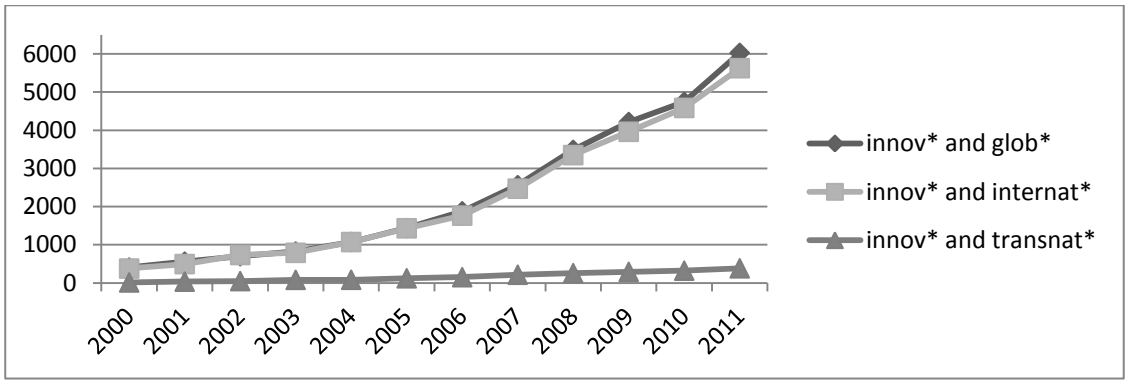

Fig. 3. Citations annually from 2000 to 2011 (publications 1994 onwards) (source: Web of Science)

All the conducted searches show parallel results. There is a steady growing curve in the field of innovation study which is accelerating the further we get with the 20th century. However, the rate of growth is more intense when innovation is connected with globalization (or related terms). There are also differences between the three groups I used while forming the searches. Connecting globalization with *innovation* or with *innovation and community* provides the most results (within the peer groups) both in the number of published items and annual citations. When the connected topic is *internationalization* the results are somewhat lower but the growth shows parallel rate with globalization. As for using *trans-nationalization* I found that it is not as used and familiar in the field of innovation study as the other two topics are and therefore the results remain much lower than in the other two searches. Nevertheless using trans-nationalization gives similar results in both search groups (connected either with innovation or innovation and community) and it has actually the most intense growing rate how moderate the numbers may be.

To sum up, the most important thing is that all the searches I conducted show parallel results: the interest towards innovation study is growing in all focus groups. There is a growing interest toward the role of globalization of innovation and the role of global innovation communities. I consider the field of innovation study to be open to new and even more intense research.

Appendix 5

Table 1. *Article information of the 10 chosen articles with authors, article information, search words, total citations and average citations per year starting from the biggest*

	Authors	**Article Information**	**Search Words** innov* AND communit* AND	**Total Citations**	**Average Citations per year**
1.	Bathelt H; Malmberg A; Maskell P (2004)	Clusters and knowledge: local buzz, global pipelines and the process of knowledge creation, Progress in Human Geography, Vol. 28: 1, pages 31-56.	glob*	533	58.44
2.	Swyngedouw E (2005)	Governance innovation and the citizen: The Janus face of governance-beyond-the-state, Urban Studies, Vol. 42: 11, pages 1991-2006.	internat*	129	16.12
3.	Prahalad CK; Hammond A(2002)	Serving the world's poor, profitably, Harvard Business Review, Vol. 80: 9, pages 18-57.	glob*	117	10.64
4.	Maskell P; Bathelt H; Malmberg A (2006)	Building global knowledge pipelines: The role of temporary clusters, European Planning Studies, Vol. 14: 8, pages 997-1013.	glob*	69	9.86
5.	Coe NM; Bunnell TG (2003)	'Spatializing' knowledge communities: towards a conceptualization of transnational innovation networks, Global Networks –a Journal of Transnational Affairs, Vol. 3: 4, pages 437-456.	transnat*	85	8.50
6.	Simmie J (2003)	Innovation and urban regions as national and international nodes for the transfer and sharing of knowledge, Regional Studies, Vol. 37: 6—7, **pages** 607-620.	internat* + glob*	63	6.30
7.	Coenen L; Moodysson J; Asheim BT (2004)	Nodes, networks and proximities: On the knowledge dynamics of the Medicon Valley biotech cluster, European Planning Studies, Vol. 12: 7, **pages** 1003-1018.	glob*	47	5.22
8.	Dahlander L; Wallin MW. (2006)	A man on the inside: Unlocking communities as complementary assets, Research Policy, Vol. 35: 8 **pages** 1243-1259.	glob*	44	6.29
9.	Stone D (2000)	Non-governmental policy transfer: The strategies of independent policy institutes, Governance –an International Journal of policy and Administration, Vol. 13: 1, pages 45-70.	internat* + transnat*	43	3.31
10.	Lam A (2003)	Organizational learning in multinationals: R&D networks of Japanese and US MNEs in the UK, Journal of Management Studies, Vol. 40: 3, **pages** 673-703.	internat* + transnat*	34	3.40

Table 2. *Summary of key elements of the Innovation Communities (IC) in articles*

	Media of exchange	**Incentive**	**Knowledge in community**	**IC**	**IC as used in article**	**Features of globalization**	**Why globalization?**
Bathel et al. (2004)	pipelines and buzz	competitive edge for firms	tacit and codified knowledge	NO	firms/organizations exchanging information	knowledge exchange in global pipelines	technology has made global knowledge exchange easy
Swyngedouw (2005)	international governance by interact. & co-working	benefits all parties involved	combination of members knowledge	NO	innovative social movements which work through governance structure	the up-scaling of governance (EU, WTO)	new technologies of government enable the shift
Prahalad & Hammond (2002)	understanding of the BOP-markets & ability of poor communities to adopt new skills	wellbeing and economic growth (BOP) economic growth (MNC)	understanding the BOP-market environment	NO	Nongovernmental organizations and community groups, especially village communities in developing countries	'consumer pyramid' global marketplace	wellbeing and economic growth developing technology (own products for BOP markets)
Maskell et al. (2006)	firms' interaction worldwide: unusual get-togethers	reduce asymmetries & uncertainties, new products	tacit/experience based	NO	temporary clusters and inter-firm knowledge relationships	global professional gatherings	professionals get together in order to exchange ideas in face-to-face interaction
Coe & Bunnell (2003)	inter-personal networks	economic growth	learning / tacit knowledge	YES	COP + knowledge c.+ transnational c., individuals/ media	3 domains: Corporate-intuitional, social networks, hegemonic-discursive	transportation and electronic instantaneous, transnational nature of high-tech market

Simmie (2003)	gateways of urban regions / national and international nodes	economic growth	tacit /forma, local/ global	NO	firms which combine local knowledge with global (multiple sources) customers	international economy	the most innovative firms use international sources of knowledge
Coenen et al. (2004)	local-global knowledge flow pattern	learning	learning	YES	epistemic communities of researchers and scientists	cross-broader co-operation in biotech. cluster Medicon Valley	commonly understood benefits from clusters (case)
Dahlander & Wallin (2006)	FOSS communities/ individual to individual (email)	economic growth	codified	YES	open source community (FOSS) and"the man inside"	geographically dispersed community of individuals	complementary assets
Stone (2000)	through advocacy and network strategies of think tanks	raising public awareness	policy transfer	NO	independent policy institutes i.e. think tanks, NGOs	think tank bandwagon: spread from country to county	results from individual or group entrepreneurialism (see incentive)
Lam (2003)	global R&D networks and foreign academic institutions	economic growth	transnational learning	NO	.The US professional communities and 2. Japanese organizational communities	global dispersion of R&D, new knowledge and capabilities, access to unique human resources	national patters effect the way organization build networks: country of origin provides the basis (easier for some)

Appendix 5

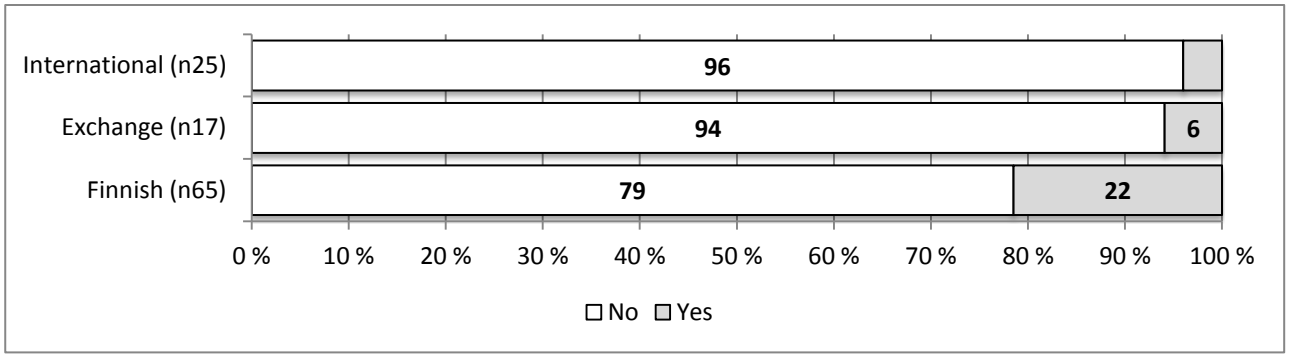

Figure 1. *Are you an entrepreneur? (N 107)*

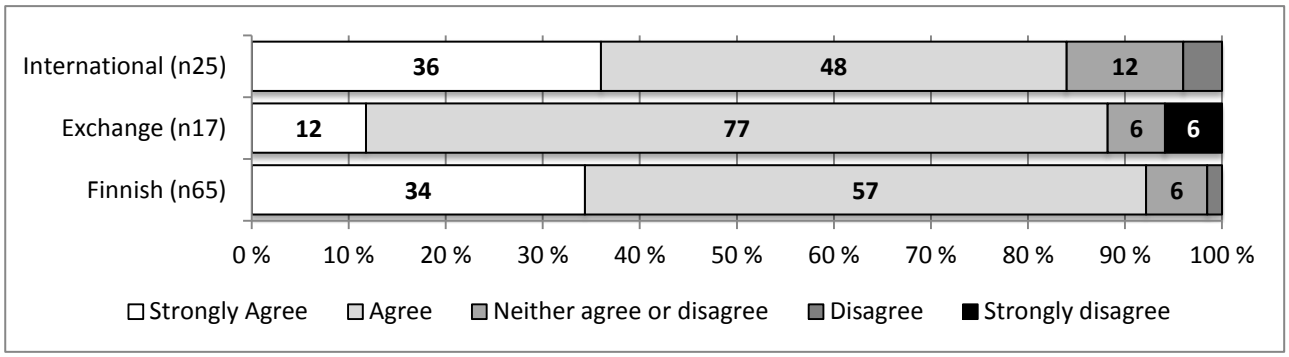

Figure 2. *My reasons to attend Demola project were mainly fulfilled (N 107)*

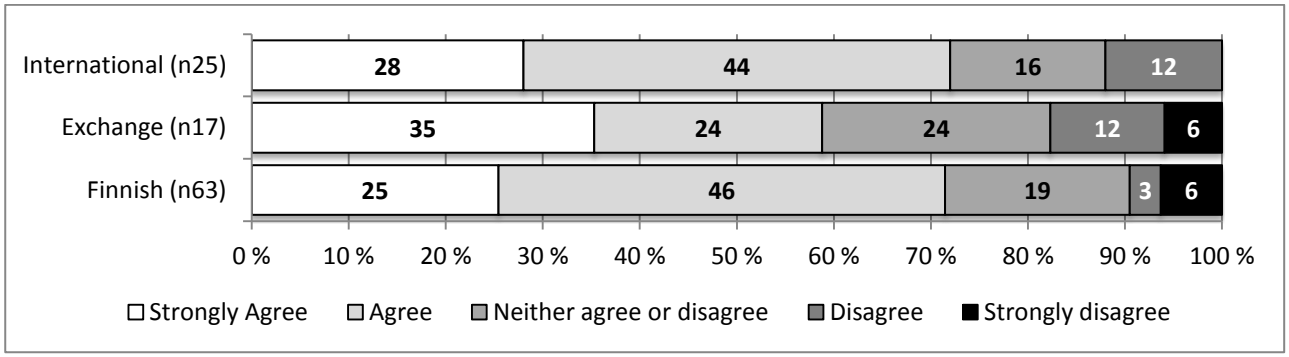

Figure 3. *I am personally satisfied with the project´s results (N105)*

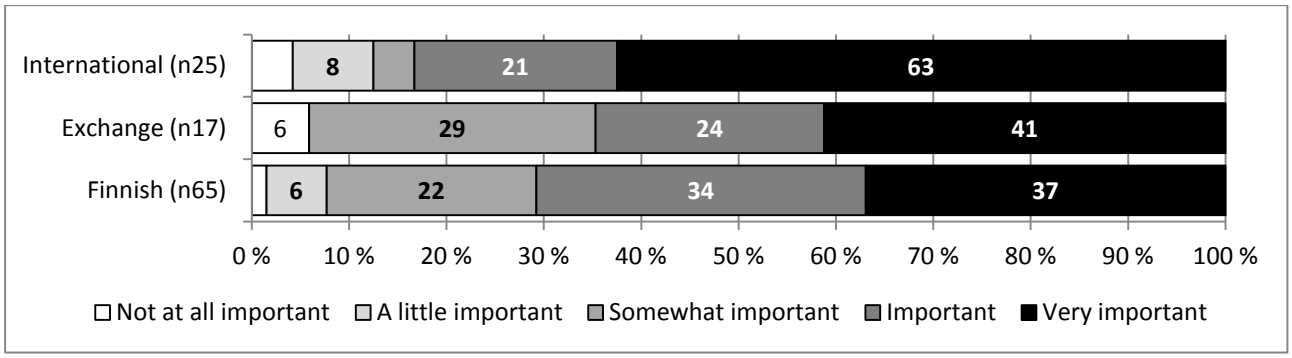

Figure 4. *Reasons to attend Demola: Importance of enhancing formal professional competencies (N 107)*

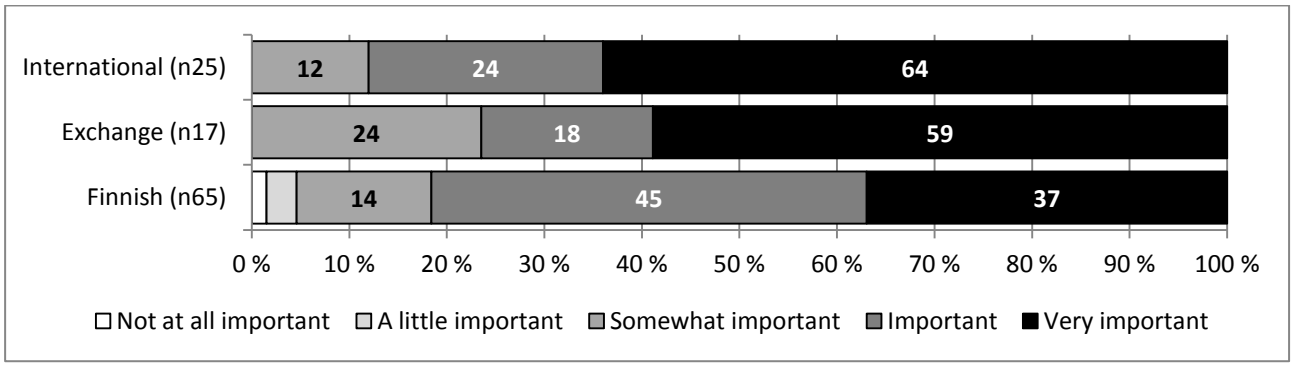

Figure 5. *Reasons to attend Demola: Importance of increasing practical competencies (N 107)*

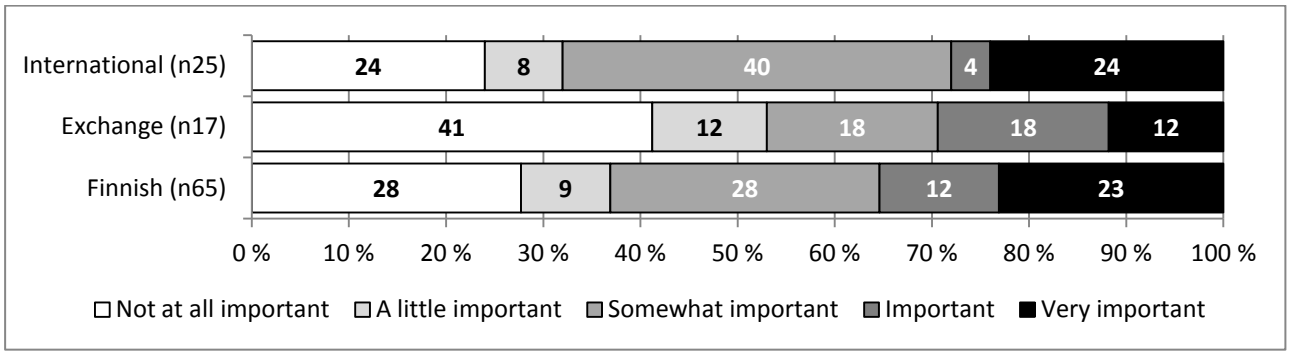

Figure 6. *Reasons to attend Demola: Importance of getting credit points (N 107)*

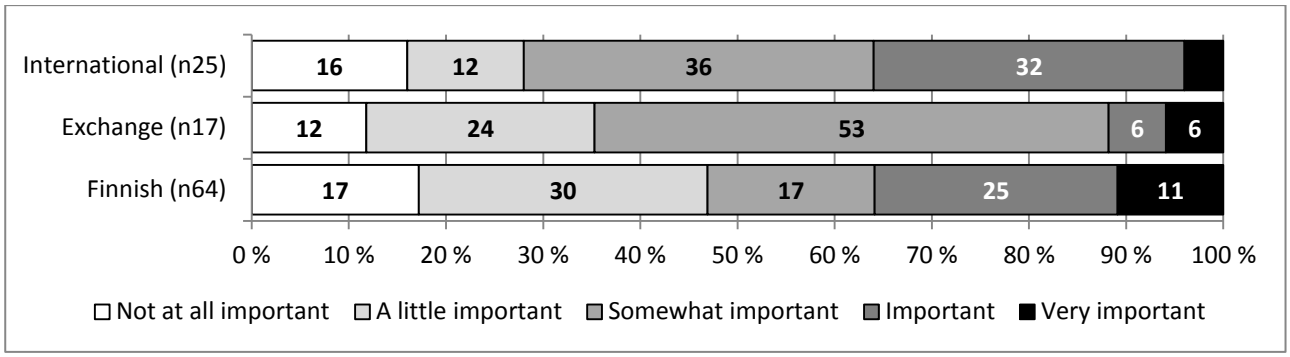

Figure 7. *Reasons to attend Demola: Importance of money (N 106)*

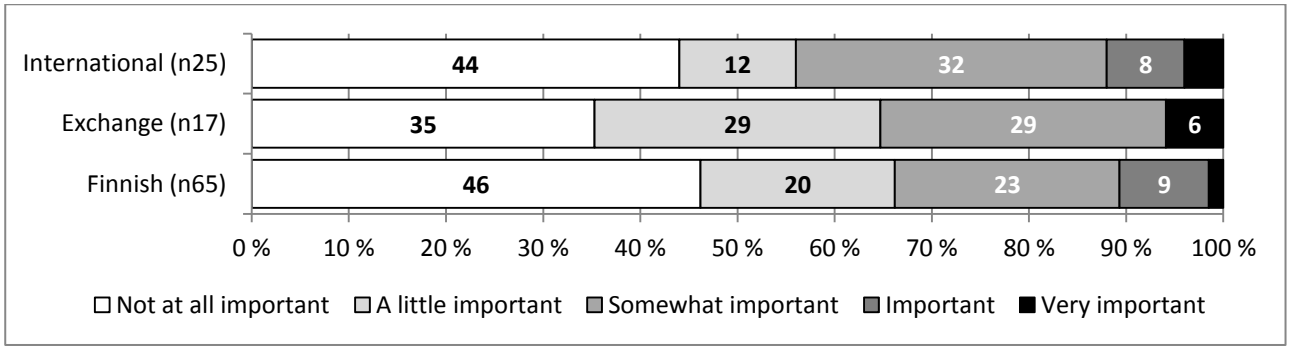

Figure 8. *Reasons to attend Demola: Importance of enhancing the quality of thesis (N 107)*

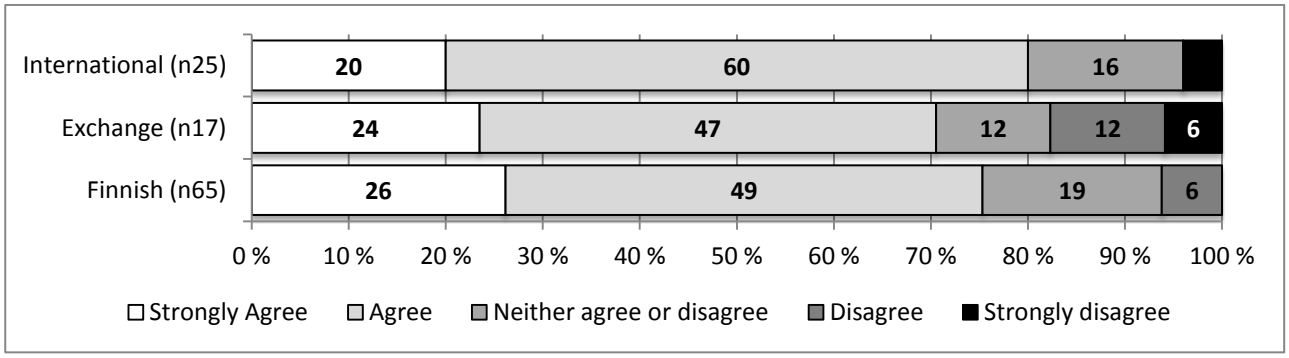

Figure 9. *Demola experience corresponded well to my goals for working experience (N 107)*

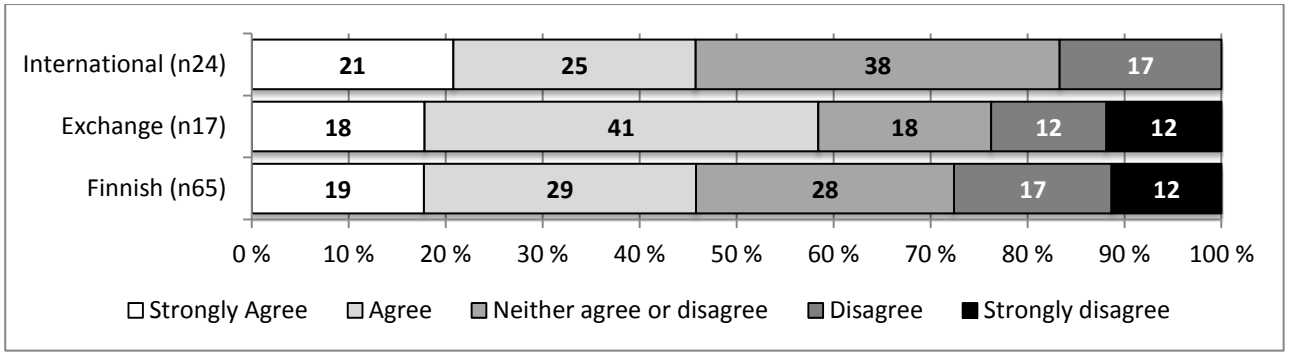

Figure 10. *Demola experience changed my thoughts about what to do in the future (N 106)*

Appendix 6

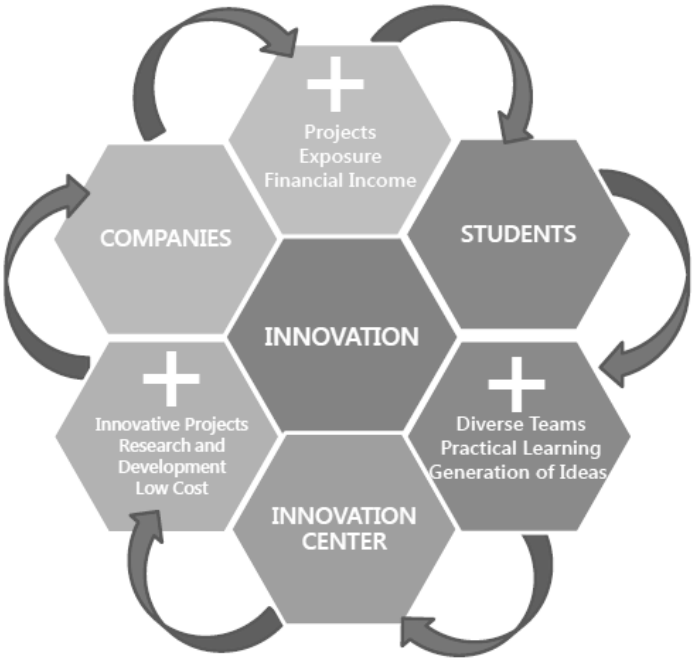

Figure 5. *Innovation process in Microsoft Innovation Center (Source: Microsoft Innovation Center Sao Paulo 2013)*